NetworkVord

The right choice - John Walter tapped as AT&T's next chief. Story, page-7.

NEWSWEEKLY

Microsoft rollouts to cover all the 'Net and NT bases

By Christine Burns and Caroi Siiwa

The Internet. Corporate intranets. Electronic commerce.

Microsoft plans to attack all three of these industry sweet spots over the next two weeks. The company is hosting two conferences to show off some of the electronic commerce and Windows NT-based Internet and intranet wares it has only hinted about during previous briefings.

Following his "Internet at your fingertips" keynote address at the Site Builders Conference in San Jose, Calif., Chief Executive Officer Bill Gates will hold a press conference Wednesday to outline the company's electronic commerce strategy, a Microsoft spokeswoman said.

Along with a cast of supporters, Microsoft will launch, and shortly thereafter ship, its Merchant Server 1.0 (NW, Oct. 21, page 16). With Merchant Server, retailers can set up a single storefront or an entire mall on the Internet.

One company that is

BACK TO BACK

Microsoft CEO Bill Gates this week will talk up the company's electronic commerce plans, which are expected to include:

- Merchant Server 1.0
- Internet Information Server 3.0 Proxy Server 1.0



Microsoft Senior Vice President Jim Allchin next week will elaborate on the company's Windows NT-based intranet plans, which are expected to include:

- ► The Windows Common Console administrative tool for managing distributed NT servers
- ► A next-generation directory service
- New Kerberos-based security

expected to be on hand to celebrate the Merchant Server launch is Wal-Mart Stores, Inc. big-name customers include Tower Records, Inc.,

See Microsoft, page 14

Domino to topple Notes?

Lotus officials debate company's groupware future in light of customers' move to the Web.

By Barb Coie

Cambridge, Mass.

After nearly a decade educating the market about groupware, could Lotus Development Corp. be ready to turn its back on the Notes name?

Lotus is asking itself that very question, according to sources who describe a debate within the company as to whether the Web-oriented Domino or Notes should be positioned as the company's predominant server tech-

While Domino today is a Web

Get more on Network World Fusion, including: A review of the Domino server Link to an online Web server comparison A downloadable copy of Domino **Enter the number** to the right in the DocFinder box on

add-on to Notes, the company is readying a new batch of Web servers, code-named Domino II. When released, Lotus will divide its products into two lines -

Notes Release 5, which will include Domino II features fully integrated, and other versions of Domino II that do not require Notes.

Once Domino is decoupled from Notes, the question becomes: Which brand do you push the most? "This is a big debate at Lotus," said Matt Cain,

See Domino, page 76

The truth about virtual LANs

the home page.

By Jodi Cohen

San Jose, Calif.

AN switching vendors have spent the past couple of years boasting about how much easier it will be to manage your network using virtual LAN technology. But have VLANs really lived up to the hype?

Sure, when it comes to the basics, like logically grouping dispersed end users across switched networks, controlling broadcast domains and easing administrative

But as far as enabling more

sophisticated network management, such as defining

VLANs by application type,

the technology has let custom-

ers down. In addition, some

consultants said VLAN man-

agement is so complex that

customers with 500 or fewer

end users should not even

said David Passmore, presi-

dent of Decisis, Inc., a consul-

tancy in Herndon, Va.

"VLANs help with adds,

moves and changes as well as

containing broadcasts, but

they seriously complicate end-

to-end net management."

"VLANs are a mixed bag,"

bother with the technology.

mize multicast and broadcast traffic," said John Morency, principal at The Registry, Inc., a consultancy in Newton, Mass. "[Another] salient benefit of VLANs today is simplifying moves, adds and changes." These are good points, said Nicholas Heilweil,

"VLANs are great if your objective is to mini-

senior telecommunications analyst at J. Paul Getty Trust, a philanthropic organization in Los Angeles that relies on a 1,000-user VLAN based on network addresses.

See VLAN, page 74

Gurus prove that encryption's not all it's cracked up to be

By Eilen Messmer

Baltimore

Two eminent Israeli cryptographers last week sent a shock wave through security circles with the announcement that they had figured out a way to extract private Data Encryption Standard (DES) encryption keys from such things as PCs and smart cards.

Adi Shamir and Eli Biham

showed they could get at even a 168-bit Triple-DES secret key by applying small amounts of heat or radiation to change the key's bit structure. Then, using a technique known as Differential Fault Analysis (DFA), they compared the encrypted outputs from both the damaged and undamaged cards to derive the

See DES, page 14

NEWSPAPER \$5.00 100

VLAN value

First, however, the good news. VLANs offer a variety of technical benefits, analysts and users said.

Start-up eyes VLAN manageability

By Jim Duffy

San Jose, Calif.

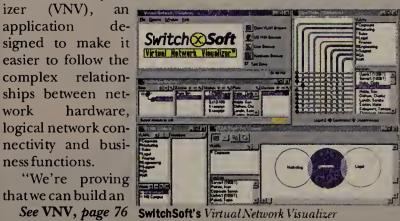
Whether you wouch for or vilify VLANs, there is no question they raise volumes of management concerns.

That's why, at this week's Switched Networks & VLANs conference here, one start-up company will voice its devotion to making multivendor VLAN management viable.

SwitchSoft Systems, Inc. will debut Virtual Network Visual-

application deeasier to follow the complex relationships between network hardware, logical network connectivity and business functions.

"We're proving that we can build an



Access Network World Fusion using the number in yellow. See page 5 for details.

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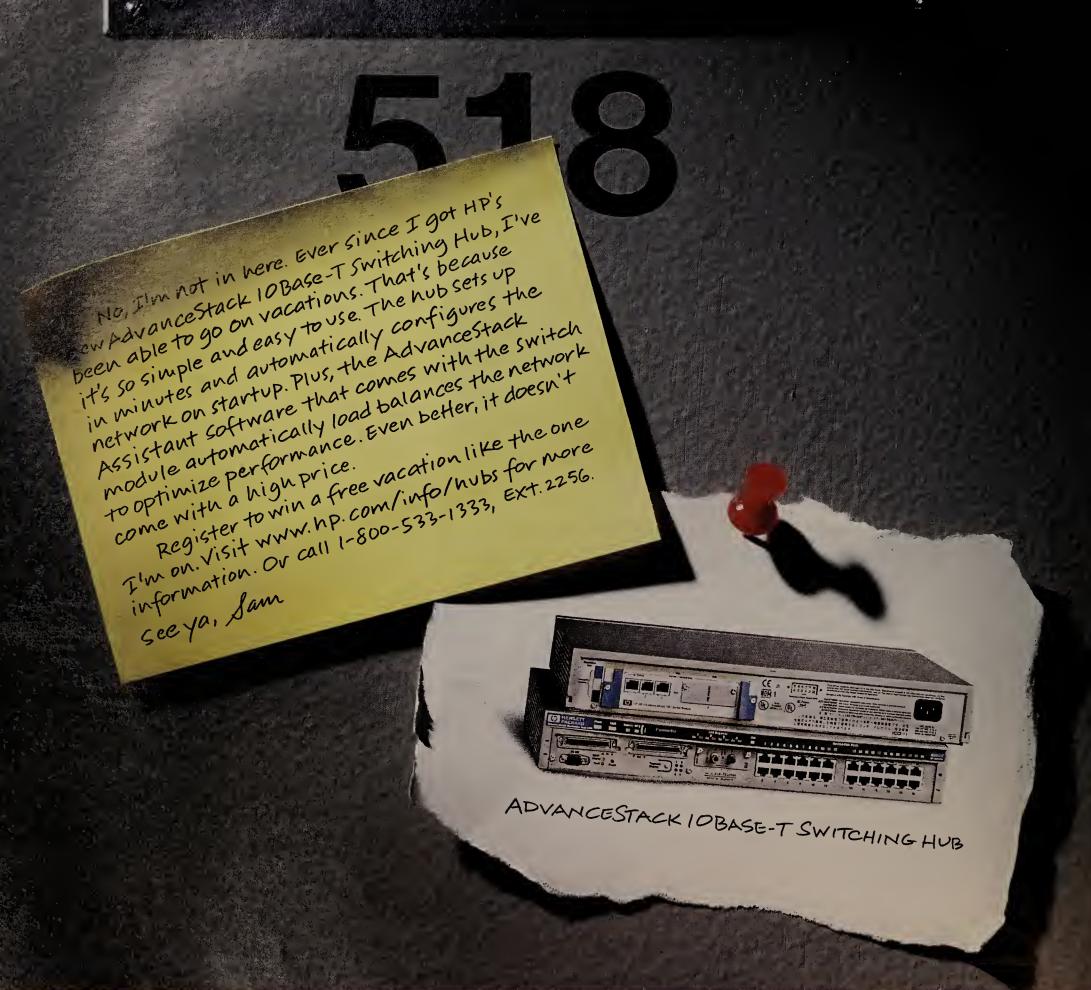
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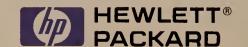


Managing Network Computing. The Smart Way.

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This Week



- **Groupware:** Download a copy of Lotus' Domino server, read our review and one consultant's comparison of Lotus Notes and Microsoft Exchange. DocFinder: 2810.
- Security: Two Israeli professors say they have cracked the encryption used in smart cards. Learn how they did it and download a timeline charting the evolution of cryptography. DocFinder: 2814.
- VLANs: Download VLAN primers and check out VLAN strategy papers from several vendors. DocFinder: 2811.
- Frame relay: See how different vendors are developing technology for voice and video over frame relay. DocFinder: 2803.
- Internet I: Stay current on spamming news. Get a copy of the Blacklist of Internet Advertisers and read one bulk mailer's court pledge to leave an Internet service provider alone. DocFinder: 2802.
- Internet II: Grab documents that explain a proposal to expand the number of organizations able to give out domain names. DocFinder: 2813.



NetRef

- Intranets: New this week is the Network World Guide to Intranets. It's a compendium of articles on intranets, covering everything from why you should build an intranet to the technologies you'll need to get it up and running smoothly. You can browse the Network World Guide to Intranets online, chock full of hyperlinks, or download a Word for Windows version as an offline resource. DocFinder: 2820.
- TCP/IP: Read our report on RSVP (page 47), then go online to grab a copy of the current RSVP draft. DocFinder: 2801.
- Servers: Download spreadsheets with detailed testing data on the trio of servers we reviewed this month. DocFinder: 9306.

HOW TO GET ON TO NETWORK WORLD FUSION

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CONFERENCE PICK

Should an ISP be more like a phone company? Read Scott Bradner's column (page 40), then voice your opinion.

Select Forum, Columnists then Bradner.

NetworkWorld

An IDG Publication

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- IBM and Novell revise LAN-to-host gateway in face of Microsoft
- AT&T's choice of president leaves industry dumbfounded.
- An alternative way to bring ATM to the desktop emerges.
- Newly formed committee to investigate domain name registration.
- Frontier buys its own fiber infrastructure.
- **Tandem readies** new line of Pentium Pro servers.
- Cisco adds variety to its remote access line.
- Industry consultants debate the benefits of VLANs.
- **VPNet tries to make** the Internet more secure.

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- Tivoli rolls out helpful mainframe components.
- **ADC Kentrox gets into** T-3 frame relay.

Carrier Services

- Orbital Sciences launches voice-over-frame link with the help of LCI International.
- **NYNEX** goes with fiber to the curb.

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Jon Postel, head of the

Internet Assigned

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discusses the 'Net and

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NetworkWorld's Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.

News briefs, October 28, 1996

Cooley departure

Ross Cooley, Compaq Computer Corp.'s senior vice president and general manager of North America, is

and general manager of North America, is leaving the company after 12 years for an Austin, Texas-based electronic commerce start-up. Cooley joins a long list of top Compaq executives who have left the Houston-based company in recent months. James Schraith, former president and chief executive officer at The Cerplex Group, Inc., will take Cooley's position. Cooley will join pc-Order.com, which runs an online sales database of available computer products.



Cooley

Traffic control

IBM, MCI Communications Corp. and Cascade Communications Corp. are among the latest companies to join the IP Multicast Initiative, an industry group formed last month to address traffic congestion on the Internet and corporate intranets. The initiative includes 3Com Corp., Bay Networks, Inc., Cabletron Systems, Inc., Netscape Communications Corp. and others. The group hopes to speed the adoption of the Internet Engineering Task Force's IP Multicast technology, which promises to improve bandwidth usage for applications that communicate with multiple recipients. The group's first meeting is slated for December.

Get yer Web tools here

Some of the biggest names in applications are readying tools for building better Web-enabled applications. Oracle Corp. will show off Developer/2000 for the World-Wide Web at the Oracle Open World conference in San Francisco, which begins Nov. 4. The software is designed to move existing applications to the Web. Sybase, Inc. subsidiary Powersoft Corp. will announce next week the Internet Developer Toolkit for PowerBuilder 5.0, an add-on to the PowerBuilder Windows application tool. And NeXT Software, Inc. next month will ship WebObjects Enterprise 3.0, a development tool kit featuring the WebObjects Builder for creating Web sites that combine ActiveX, Visual Basic Script, JavaScript and HTML.

The FCC makes an appeal

■ The U.S. Solicitor General, on behalf of the Federal Communications Commission, last week asked the Supreme Court to vacate a stay of the FCC's rules for opening up local

telecommunications markets. The stay was imposed earlier this month by a federal court in Missouri, leaving telecommunications reform near a stalemate. The FCC warned that the stay assures that local competition would require "prolonged, piecemeal ligitation" in courts across the country.

Netscape rakes it in

Netscape Communications Corp. last week reported \$100 million in revenue for the third quarter — a 33% jump over the \$75 million it posted in the second quarter. Revenue more than quadrupled that recorded in last year's second quarter. Client software continued to account for the lion's share of the company's revenue, representing 59% of the total. Server software brought in 25%, and professional services filled out the remainder. The second quarter breakdown was 60% client, 23% server and 17% services. Earnings jumped from \$200,000 in last year's third quarter to \$7.7 million in this year's third quarter.

Diffusion to clear up confusion

Start-up Diffusion, Inc. this week will introduce IntraExpress, a Windows NT application that lets end users receive information however they want it. Delivery choices provided by the Mountain View, Calif., company's software include E-mail, pager, printer, fax, File Transfer Protocol or an HTTP stream to a Web server.

NetWare connectivity

IBM/Novell ready revised LAN-to-host gateway tool

Version 2.2 of NetWare for SAA to be priced on a per-client basis.

By Michael Cooney and Christine Burns

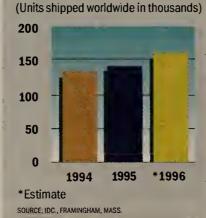
Rosto

It's been a long time coming, but IBM and Novell, Inc. next week will announce a revised edition of their market-leading LAN-to-host gateway product.

With Version 2.2, IBM and Novell will go a long way toward making NetWare for SAA more affordable and flexible, according to documents obtained by *Network World*.

The first major improvements to the product since IBM took over development more than a year ago will focus on TCP/IP connectivity, file transfer capabilities and Windows client support. Customers will also be able to pay for the product on a per-client basis rather than per-session.

SNA GATEWAYS ON THE RISE



IBM and Novell hope the update will counter some of Microsoft Corp.'s momentum in the market with its SNA Server product. Microsoft has already added new features this year and has more on the way.

"Even with this new release of NetWare for SAA, we feel that IBM and Novell are still a full release of software features behind us at this point," said Vesa Suomalainen, general manager of Microsoft's SNA Server product unit.

Despite that assessment, Version 2.2 of the IBM and Novell product should prove attractive, especially its per-client

pricing scheme.

Most clients can support multiple sessions with a host either to multiple applications or printers. Reducing those session charges by billing for just the client software eliminates a lot of confusion and cost.

"The licensing fee change has the potential to save users, especially large users, thousands of dollars," said Joe Makoid, vice president of sales and marketing for BusTech, Inc., which will resell Version 2.2 as part of its channel-attached LAN gateway.

Another key customer requirement addressed in Version 2.2 was support for TN3270E. This is an updated version of

TN3270, which allows SNA users to connect to mainframes over TCP/IP and supports printing.

TN3270E support is critical to David Hasselbach, a network engineer at the University of Michigan's medical center in Ann Arbor. It will let his organization print from the mainframe and give roaming end users mainframe access, he said.

Version 2.2 also includes native support for Novell Directory Services (NDS). This alleviates configuration hassles associated with running the gateway on a NetWare 4.X server in bindery emulation.

"We have held up our migration to NetWare 4.X because the gateway in the past has not supported NDS natively," said Martin Carmen, a LAN consultant with a large West Coast savings and loan institution. He will upgrade his servers to NetWare 4.X and NetWare for SAA at the same time, which will enable him to configure the company's 200 gateways simultaneously rather than individually, as was required with bindery emulation.

Other new features include an Advanced File Transfer Protocol-to-File Transfer Protocol gateway and support for 32-bit Windows NT and Windows 95 applications.

LAN-to-host connectivity combatants

IBM and Novell are poised to deliver a revised edition of NetWare for SAA at the same time Microsoft will release its own SNA Server upgrade.

Feature	NetWare for SAA 2.2	SNA Server 3.0
FTP-AFTP gateway	Yes	Yes
TN3270E support	Yes	Yes
ESCON channel support	Third-party provided	Third-party provided
32-bit API support	Yes	Yes
Native Novell Directory Service support	Yes	Planned
Client-based licensing	Yes	Yes
Concurrent sessions	2,000	15,000

IBM and Novell acknowledged the upcoming announcement was taking place but declined to comment on details.

Indeed, most observers said IBM has a completely reworked version of the NetWare for SAA product in the works, but it is likely to be a year or more before it reaches users.

"When IBM picked up the development of NetWare for SAA, they immediately realized they were working with code developed in the Middle Ages," said Frank Dzubeck, president of the Communications Network Architects, Inc. consultancy in Washington, D.C.

"But it is a tactical product for IBM, and these new enhancements will keep users happy while the product is being retooled," he said.

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Obscure AT&T heir apparent sparks wait-and-see attitude

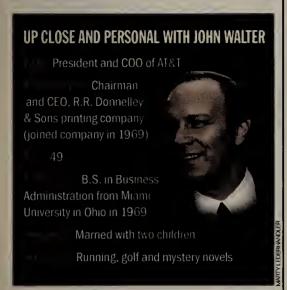
By David Rohde

New York

AT&T's appointment last week of a new president from outside the networking industry left users and edgy investment analysts scratching their heads and asking, "Justwho is John Walter?"

The carrier's choice of Walter as chief operating officer and heir apparent to Chief Executive Officer Robert Allen went over like a lead balloon on Wall Street. Investors wailed over the continuing erosion of AT&T's consumer market and immediately lopped nearly 5% off its stock price.

But Walter, previously the head of a big printing company best known for churning out telephone directories, is expected to bring his background as a corporate reorganizer to AT&T's aid. Walter moved R.R. Donnelley & Sons Co. from a strictly physical commercial printer in the 1980s to a global supplier of electronic information in the 1990s.



His new challenge will be to make an impact in a company nearly eight times Donnelley's size. "It matters very little who the head of the [AT&T] bureaucracy is," said Robert Rosenberg, president of Insight Research Corp., a consulting firm in Livingston, N.J. "Decisions about whether frame relay is a better near-term revenue generator than ATM really will never reach his desk."

Like Allen, Walter has spent his entire career at one firm — Donnelley — and as a result, is likely to have a somewhat restricted view of the world. "Nothing in his resume suggests a visionary or a revolutionary," Rosenberg said.

And some asked whether Walter can move fast enough. "The telecom business is so complex and growing so fast that it makes for a big learning curve," said Julie Stewart, general manager of telecommunications at Rosenbluth International, Inc., a Philadelphia-based travel agency.

Walter takes AT&T's helm in the midst of a wave of public ridicule over the company's loss of market share, growth prospects and organizational mistakes.

But analysts noted that most of AT&T's recent setbacks have occurred in its consumer business. By contrast, AT&T has been holding its own or even increasing

its market share in key business markets.

For example, AT&T's share of the frame relay market grew from 39.3% in 1995 to an estimated 42.2% this year, according to the "ATM and Frame Relay Industry Update" from Vertical Systems

Group in Dedham, Mass.

And while Walter may not know the innards of the industry's current marketing and interconnection battles, he is likely to understand the basics of enterprise networking, Rosenberg said.

Donnelley's digital printing initiatives — which involve shipping page proofs and graphic materials among plants domestically and internationally — have taken the company into private lines, ISDN and virtual private networks, Rosenberg said. "Believe me, he knows as much about bits and bytes as Bob Allen ever did," he said.

Sometimes Close is not Good Enough...



It seems that a lot of vendors are taking up the SNA over frame relay game. However, there are no substitutes for the right equipment, plenty of experience and knowing the course when it comes to implementing a winning SNA solution.

Sync is a recognized leader in SNA internetworking and multi-protocol frame relay access solutions. Our award-winning frame relay access products, proven SNA experience, and understanding of the IBM networking landscape has made Sync the number one choice of service providers for their SNA over frame relay managed services.

When it comes to migrating your SNA network to frame relay, avoid hazards -- ask your frame relay service provider for Sync products or call 1-800-ASK-SYNC. Sometimes close is not good enough and you won't get another shot with your network.









Plan to revamp 'Net name distribution gets delayed

Committee to investigate plan for domain name registries.

By Chris Nerney

Several members of a committee that will review a plan to expand the number of top-level Internet domains and registries say the already-delayed proposal may undergo substantial changes.

Drafted by Jon Postel (see Q&A, this page), head of the Internet Assigned Numbers

Authority (IANA) and backed by the Internet Society (ISOC), the plan calls for the establishment of new global domain

name registries and as many as 150 new international top-level domains.

Currently, there are only a handful of global top-level domains, such as .com, .org and .net, and only one domain name registry: Network Solutions, Inc. of Herndon, Va. The names registered in each domain, for example, www.microsoft.com, are the Internet equivalents of addresses.

Shaw calls Postel's

point" for ad hoc

proposal "a starting

Postel and the ISOC had hoped to form a panel that would begin accepting applications this fall from companies seeking to own registries, and to have new registries up and running as early as next March.

But that timetable has been sidetracked by resistance from members of the Internet community who say implemention of the current plan would exacerbate mounting legal problems involving domain names and international trademark laws.

Critics of Postel's proposal also question the authority of IANA and ISOC to design and implement a wholesale change in the domain name system.

ISOC President Don Heath acknowledged that the inability of the plan's supporters to achieve "consensus" in the Internet community led to the formation of the International Ad Hoc Committee (IAHC) announced lastweek.

Heath, an appointee to the 10-member IAHC, said the panel "is going to look at the issues raised from consideration of the proposal and make a determination whether to proceed or not."

Asked if Postel's plan could



Internet Society
President Don Heath
says changes to
Postel's plan are "a
possibility."

be revamped, he said, "It's a possibility."

Whatever changes are made, Heath said, "ultimately, I think we will have additional registries and additional top-level domains."

Robert Shaw, an adviser to the International Telecommunication Union and an appointee to IAHC, said the panel likely will

use Postel's plan as "a point of departure."

IAHC member David Maher, a Chicago-based trademark attorney, said the Postel proposal is "a starting point. It is not set in stone" Postel said he declined to serve because he believes the panel should not be made up of the existing management of the Internet.

However, Tony Rutkowski, a critic of both Postel's plan and the ISOC, said the new committee "is generally perceived as a top-down attempt" at control by the ISOC and other Internet insiders.

Rutkowski, a former ISOC president, said only a "bottomup, broad-industry effort" can successfully address Internet administrative and policy-making efforts.

"It can't be any single organization saying, 'I am in control,' "he said. ■

Postel: the man behind the plan



In a rare interview, Jon Postel, head of the Internet Assigned Numbers Authority, last week spoke with *Net*work World Senior Writer

Chris Nerney about Postel's proposal to expand top-level domains and registries.

It seems as if the Internet Society's (ISOC) appointment of an ad hoc committee to study your proposal has allowed you to extricate yourself from the middle of the debate.

It would be nice, but I don't think it's going to turn out that way. But it is likely the focus will change to this committee.

What has been the main goal of your proposal?

When the InterNIC started charging to register domain names more than a year ago, it generated a lot of discussion. It seemed pretty obvious to me that there was

a need to have some competition to make sure there was good service at fair prices. That's been my goal all along. People keep dragging extraneous issues into it, but I try to keep focused on the goal.

What do you consider an extraneous issue?

To say it's completely extraneous is probably overstating the case, but trying to solve the problem of how trademarks and domain names relate to each other is part of trying to create new domains. Fixing the domain names-trademarks relationship is going to be very hard because the trademark world is a complete mess.

There has been criticism that your proposal, and ISOC's support of it, is a top-down solution, yet there were months of public discussion online about it.



That's my take, as well. We listened to a lot of debate and argument from a few very vocal people, and a larger number of people who made more calm suggestions, and tried to integrate what worked together. And one guy's saying, 'It's got to be X,' and another guy's saying, 'It's got to be not-X.' You can't

incorporate both of those suggestions.

What is the status of your proposal now? Is it back in the garage?

No, no. The announcement by Don Heath about this committee being established and being shepherded by ISOC is a dramatic move forward, using this proposal as a base to actually do something.

Is it inevitable that there will be more top-level domains and more registries?

I'm sure there will. ■

Cells in Frames Alliance settles on specification

By Michael Cooney

A group of vendors last week issued a specification that defines a way to run ATM traffic to the desktop over existing Ethernet and token-ring LANs.

Cells in Frames (CIF) 1.0, once implemented in products, should give users that want to bring ATM to the desktop an alternative to swapping out existing network adapter cards for newATM ones.

The specification emerged from the CIF Alliance, a group of about 30 vendors and customers that began meeting in March. The group's goals are to bring ATM technology to the desktop economically and to ensure multivendor interoperability.

Eventually, it may extend the specification to cover Gigabit Ethernet.

As standards processes go, the adaptation of Version 1.0 moved at lightning speed; it was approved in seven months.

"All of the vendors and users involved will now standardize on Version 1.0, and true implementations can begin," said Scott Brim, senior technical adviser for Cornell University's Information Technology unit.

Cornell has been developing and piloting CIF implementations for over a year. The school wanted to move its more than 10,000 workstations — mostly Ethernet-attached — to ATM without tossing out existing

Ethernet boards and hubs.

CIF functionality would be built into software on a PC or switch and encapsulate 53-byte ATM cells in Ethernet or token-

CELLS IN FRAMES ALLIANCE A sampling of members:

- ▶ 3Com
- **►** 3M
- ► Agile
- ► Apple
- ► Bay
- ► Bell Atlantic
- ► Brooktree
- Cisco
- ▶ Connectware
- Cornell University
- ► IBM

ring frames. A second CIF device at the other end of the connection would be needed to complete the transmission. Data can be forwarded onto another LAN site or onto an ATM backbone.

The CIF capabilities that intrigue most users and vendors are its ability to support quality of service, prioritization, available bit rate service and other features associated with pure ATM technology.

"CIF has potential big-time benefits. It takes the best parts of ATM and runs them on top of any underlying communications plumbing without a lot of fuss," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

Detractors say CIF is not as simple as it sounds. It could

require new adapter boards in some PCs, plus it requires software changes and could add an undue amount of overhead to

"We really define CIF as a stepping stone to ATM, not a true alternative to it," Brim said. "Ultimately, CIF doesn't preclude migration to a totally switched ATM environment."

CORRECTIONS

A page 6 news brief last week said that Bay Networks, Inc. posted disappointing earnings for its 1997 fiscal year. It should have referred only to the first quarter of Bay's 1997 fiscal year.

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Servers

Tandem finds no NT faults

Tandem President

will announce the

nesday in New York.

company's new

server line Wed-

and CEO Roel Pieper

By John Robinson

San Francisco

Tandem Computers, Inc. this

week will come down from its proprietary mountain embrace Windows NT with a new line of Pentium Proservers.

The S series includes the one- to twoprocessor S100 and the four-processor S1000, which is also available in a rack-mountable configuration, sources said. The products mark Tandem's first shift away from its

Unix-centric line of Himalaya servers running MIPS processors and a variety of Tandem-specific middleware.

Both servers feature 200-MHz Pentium Pros and are available with Tandem's ServerNet interconnect technology for tying together multiple boxes in a single cluster.

Tandem officials refused to comment on the new servers, deferring to Wednesday's scheduled announcement in New York. However, one source close to the company said the servers are the first in a line of products designed to bring Tandem technology to the masses.

"The servers will give people the scalable advantages of [Tandem's] Himalaya server line in a Windows NT environment," the source said. "[The technology]

will help Microsoft get to the enterprise faster."

Tandem's relationship with

Microsoft Corp. is not new. In May, Microsoft paid more than \$50 million to license Tan-NonStop dem's ServerWare Solutions for Windows NT. ServerWare includes Tandem's SQL database, distributed messaging and object management environment, and its clustered transaction processing environment.

And Wolfpack,

Microsoft's clustering API for NT servers, will include drivers for Tandem's ServerNet interconnect technology and integrated support for ServerWare.

Tandem is licensing Server-Net to other companies, including Dell Computer Corp. and Compaq Computer Corp., sources said. Eleven other companies are also reported to be in negotiations to port the interconnect technology to their server lines.

Tandem, apparently not abandoning its Himalaya family, this week will also announce two servers boasting a new core system architecture.

The Himalaya 7000 and 70000 use the ServerNet technology and are based on the company's new System Area Network architecture.

Frontier fiber build out costs half a million

Carrier forced to build when no one world lease.

By Tim Greene

Rochester, N.Y.

Why would Frontier Corp. spend half a billion dollars to build its own fiber network in the middle of a fiber bandwidth

The answer is that there is a big difference between fiber and obtainable fiber bandwidth.

Frontier said it put out proposals to lease fiber from other carriers, but they often responded that they either did not have enough fiber to lease or they did not have any they were willing to lease.

"The entire carrier industry is running low," said Liza Henderson, a broadband consultant for TeleChoice, Inc., a consultancy in Verona, N.J., referring to the physical wires.

Meanwhile, carriers that own fiber networks, such as MCI Corp., are dramatically boosting their network capacity by installing newer technology, typically Wave Division Multiplexing, on their existing fiber

As a result, they have more bandwidth available than they know what to do with, according to Frank Dzubeck, principal with Communications Network Architects, Inc. in Washington, D.C. "There is excess capacity in each individual fiber," he said.

Some experts estimate that each of the big three interexchange carriers has enough fiber to handle all long-distance traffic (*NW*, July 29, page 61).

And if you are a carrier that owns a fiber network, you do not want to lease out the physical fiber because it produces little

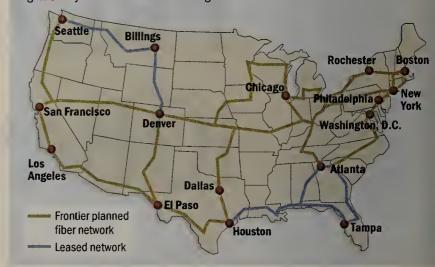
Faced with that very problem, Frontier announced last week it would buy into a 13,500-mile, coast-to-coast fiber network along railroad rights of way (see

The \$500 million investment gives Frontier 50-year rights to 24 fibers in the 96-fiber network owned by Qwest Communications Corp., which is also seeking other investors in the \$2 billion project.

Synchronous Optical Network (SONET) technology makes the network fully redundant and reverses traffic around any breaks in the fiber with virtu-

FOLLOW THE RAILS

Frontier is helping to install a \$2 billion, 13,000-mile SONET network along railroad rights of way to avoid the cost of leasing from other carriers.



profit. Plus, it gives competitors an inexpensive way get around buying your more profitable product: bandwidth. "You're actually bypassing yourself," Dzubeck said.

That all conspires to keep the price of bandwidth high in the midst of plenty.

ally no downtime.

The purchase means that Frontier will not only have more bandwidth available, but at half the current cost. The company said some of those reduced costs might be passed along as lower rates, but how much was uncertain.

Cisco rounds out its remote access line

New 3600 access server, 1600 router aimed at branch offices, Internet applications.

By Jim Duffy

San Jose, Calif.

Cisco Systems, Inc. moved to fill out its remote access product arsenal with a dial-access server for regional offices and an Internet/intranet access router for remote sites.

which includes the two-slot encryption capabilities. 3620 and four-slot 3640 — provides modular ISDN dial access at an entry-level price.

The servers can be outfitted with a variety of modules, including mixed-media modules that combine single or dual LAN attachments with two WAN links. They also support ISDN Primary and Basic Rate Interface cards, as well as synchronous and asynchronousserial links.

Both servers will support a range of Cisco Internetwork Operating System software features including IP routing, Resource Reservation Protocol and Weighted Fair Queuing. The 3600 line will also provide Cisco's new 3600 server line firewall and payload data

Internet game supplier Mpath Interactive has been using the 3640 for about two months to access its Internet service provider's point of presence to provide "fast action" game service. "We're using it for packet filtering to keep nasty people out of our internal network," said John Paul O'Brien, network analyst at Mpath.

The new access servers can be configured using Cisco's Click-Start Web-based tool and managed via the SNMP-based CiscoWorks application.



The Clsco 3600 is targeted at regional and branch office dial-access concentration.

The 3600s will go up against Bay Networks, Inc.'s Marlin, which sports a single PRI for

midsize to large branch offices and costs \$1,995.

Configured with IP routing, the 3620 starts at \$2,900, while the 3640 starts at \$6,500. PRI modules start at \$2,600 and BRI cards at \$1,100.

All products are available now.

For dialing in to the 3600 from a remote site, Cisco unveiled the 1600 line. It consists of four models, each featuring one Ethernet, one integral WAN link and a slot for additional WAN ports.

The 1601's serial link requires an external CSU/DSU, while the 1602 features an integral DSU/CSU.

The 1603 has an ISDN BRI that connects to an external Network Termination-1 (NT-1) device, while the 1604 has a BRI with an integral NT-1.

The expansion slot can house



The Cisco 1600 is aims at Internet/ intranet access from remote offices.

a synchronous/asynchronous serial link supporting T-1/E-1 speeds, or a BRI with or without an integral NT-1. The 1600s line routers support IP, IPX and AppleTalk.

IOS software features within the 1600 include firewalling, authentication and encryption and IPX-to-IP gateway functions for Internet access from IPX clients.

The 1600 is available now starting at \$1,495.

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DES

Continued from page 1

The 56-bit DES is the U.S. government's approved specification for the banking industry, and it is widely deployed in software and hardware products. Security experts claim Shamir and Biham's findings raise tough questions about the use of crypto-enabled smart cards, particularly for electronic cash applications. By obtaining an encryption key, thieves could fraudulently boost the electronic cash value stored in the cards.

Security experts added that organizations using DES will have to secure physical access to DES encryption devices to prevent DFA attacks.

At last week's National Information and Security Systems conference here, a number of the world's leading cryptographers said they were jolted by the latest discovery of how vulnerable cryptosystems can be.

"The issue is significant," said Peter Neumann, principal scientist at Menlo Park, Calif.-based consultancy SRI International, Inc. He said Bellcore scientists had cracked a smart card based on RSA Data Security, Inc. public-key technology using a similar method of attack a few weeks ago, adding such cracking techniques are likely to wind up in hackers' tool kits.

Shamir is one of the three scientists who developed RSA public-key technology a decade ago.

Smart cards with microprocessors for storing personal data or electronic cash

are now taking off, particularly in Europe, with at least 200 million cards expected to be in use worldwide by 1998, said William Caelli, a professor at Queensland University of Technology in Brisbane, Australia.

Caelli said some card manufacturers, such as Siemens Gmbh, seem to do a good job of making secure cards. But other cards coming onto the market are so poorlymade that crooks with a \$180 smart-card reader and a connection to a com-



puter port can easily tamper with whatever encryption processes the card may support.

Steve Bellovin, a scientist at Murray Hill, N.J.-based AT&T Laboratories, said the Bellcore and Shamir/Biham research has broad implications for smart-card development and E-cash.

Bellovin added that the research may lead to a better understanding of the vul-

nerabilities inherent in data encryption devices used by banks or other organizations for large information transfers.

However, cryptographers have long known that no matter how strong an encryption algorithm seems in theory, it is in the software and hardware where vulnerabilities are exploited.

"You need constant threat assessment to make sure the equipment you use is still good," said Whitfield Diffie, a Sun Microsystems, Inc. engineer. His invention of the Diffie-Hellmann key-exchange system made him a founding father of cryptography.

For example, a 40-bit key can be cracked through a so-called brute-force attack that involves having a computer run through numbers until it happens upon the right key sequence. And Netscape Communications Corp. some months ago suffered major embarrassment when Berkeley graduate students easily cracked the Navigator encryption system due to its poorly designed randomnumber generator. Netscape has since fixed the problem.

One company — Orem, Utah-based AccessData Corp. — makes a living at breaking encryption systems for both law enforcement and corporations.

AccessData has broken about 90% of the encryption in commercial software applications it checks from Microsoft Corp., Borland International, Inc. and IBM, particularly by attacking the password systems the software uses, said AccessData President Eric Thompson.

Microsoft

Continued from page 1

1-800-FLOWERS, Gateway Systems Corp. and Crabtree & Evelyn.

Third-party vendors expected to make announcements include SAP AG, Sterling Commerce, Inc., TaxWare International, Inc., TanData Corp., Intactix International, Great Plains Software and Events.

Financial institutions working with Microsoft include Wells Fargo & Co., Bank of America, Citibank, First USA, American Express, Novus, Inc. and Royal Bank of Canada. Payment method support will come from Veriform, Cybercash, Inc. and Trinitech Systems, Inc., sources said.

Sources close to Microsoft say the company is also expected to announce a revision of its Internet Information Server that will include support for dynamic Web pages and ties to SQL Server databases. In addition, Microsoft will formally launch its NT-based proxy server, code-named Catapult.

Also on tap is the unveiling of the first test version of Microsoft's Internet Studio, a high-end development tool for building database-driven Web sites.

The product news is long overdue, some pundits believe. "They've been more talk than action, and they need to move more forcefully to establish them-

selves as a player in electronic commerce," said Dwight Davis, editorial director of the "Windows Watcher" newsletter.

Week 2: intranet-ready NT

During its Professional Developers' Conference in Long Beach, Calif., next week, Microsoft officials will talk up several new and improved Windows NT-based services for intranets.

Attendees will get to see the next-generation Windows NT Server directory service; a built-in, extensible common console for administering distributed NT services; and a future NT security system based on Kerberos authentication. All three of these new features — which comprise pieces of Windows NT 5.0 expected late next year — address longstanding

Check out additional resources on Network World Fusion:

Netscape's Communicator strategy

A beta copy of Catapult

The draft DCOM spec

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is not scalable, manageable or secure enough for the enterprise.

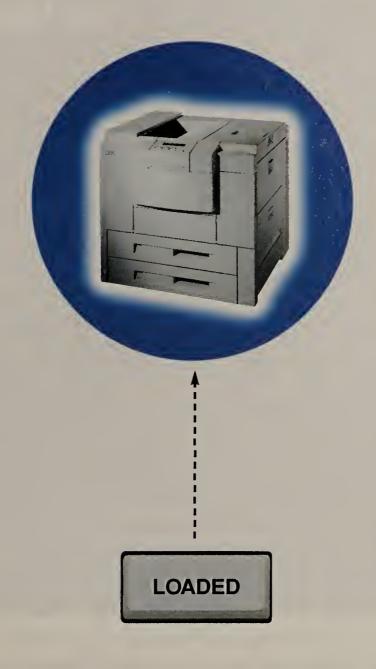
According to Jeff Price, a Windows NT Server product manager, the new directory features include:

- A hierarchical structure that lets an administrator set up the directory trees based on company structure, and grant user rights regardless of physical location
- A global directory database searchable via a Web browser
- A smart replication service so changes made to distributed directory servers can be replicated across the intranet
- Support for the Distributed Component Object Model that will help distributed objects find each other.

"Microsoft is certainly getting its share of Web toys out the door," said Rob Enderle, an analyst with Giga Information Group in Pleasanton, Calif.

Despite Microsoft's widespread marketing efforts to make it so, not all users are planning to immediately take advantage of the ever-growing supply of NT-based intranet products.

Rick Shope, manager of PC technology and planning at NationsBanc-CRT Chicago, said that even though his company is currently migrating to NT Server, he has not yet seen enough from Microsoft to make him want to move from existing Netscape intranet servers running on Hewlett-Packard Co. HP-UX machines.



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top-of-the-line printer for high-volume, high-demand, high-standards networked environments. It can handle large documents (such as 11" x 17") and, with three standard input bins, give you 3,100 sheets of uninterrupted printing.

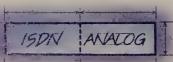
For more information on IBM's state-of-thenetwork printer, <u>call 1 800 IBM-2468</u>, <u>ext. IA140</u>. Or visit us at www.can.ibm.com/ibmprinters to see for yourself how easy IBM has made printing on the network.

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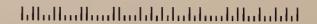
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Briefs

RAScom, Inc. in February will ship its RAServer 2000 and 2500 remote access servers with 1.5M bit/sec T-1 analog ports, each supporting 24 33.6K bit/sec modems from Ariel Corp. The servers, shipping now, support only ISDN. RAScom's



architecture is built on integrating off-the-shelf components from other vendors. The servers list for \$8,500 to \$50,500, depending on model and configuration. RAScom: (603) 898-5200.

- American Express Co. and IBM last week announced a pilot program to develop a multipurpose smart card to help business travelers speed through airports. In December, the two companies will begin testing the American Express Corporate Card using IBM smart-card technology and airline electronic ticketing capabilities. In this initial application, the smart card will verify electronic reservation and confirm traveler identification when it is swipeed through an electronic reader.
- Continuing to divest itself of nonessential product lines, Digitai Equipment Corp. has sold AssetWorks, its asset and desktop management operations, to Computer Associates International, Inc.
- Netaccess, Inc. introduced a PC card that can handle up to four ISDN Basic Rate Interface lines simultaneously. The BRI-ISA8 supports the Multi-Vendor Integration Protocol for multiplexing data, voice and video traffic on an ISDN line. It also supports the BONDING protocol, which lets users combine 64K bit/sec ISDN B channels into a single larger pipe.

Tivoli software tackles **IBM** big iron mainframe

Tivoli's Harmon says

GEM eases the man-

from mainframes to

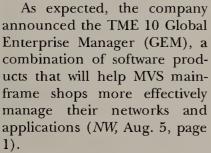
By Michael Cooney

Austin, Texas

When Tivoli Systems, Inc. agement Environment and IBM

announced TME 10 earlier this year, it was roundly criticized for ignoring MVS-based NetView users.

The IBM subsidiary last week embraced that community when it rolled out the first products that will help make the mainframe a central component of its TME 10 distributed systems and network manage- desktops. ment family.



TME 10 is a cross-platform sys-

tems and network management package that melds Tivoli Man-

> SystemView functionality to create a common package for simplifying the management of everything from mainframes to desktops and applications across an enterprise network.

"Users can now tie together the management of networks and systems linked to mainagement of everything frames, Unix or Microsoft servers as one integrated package,"

said Scott Harmon, vice president of marketing and strategy for Tivoli.

GEM includes a variety of software packages, called Management Integration Services, that tie together existing mainframebased management applications, such as IBM's SNA status, configuration, topology and

trouble-ticketing packages, to

For example, GEM provides a TME 10 gateway that will allow users to integrate data from Net-View's Resource Object Data Manager (RODM) into a TME 10 database and vice versa. RODM is a mainframe-based, object-oriented management repository.

The gateway will allow Tivoli's enterprise console or inventory application to pull information such as SNA topology or resource status from RODM, Harmon said.

Other gateways will link into the mainframe's Information Manager (Info/Man) database to coordinate trouble-ticketing events. Info/Man is IBM's problem, change and configuration management system.

The other key component of GEM is an Application Policy Manager (APM), which will

allow users to tie together and manage multiple applications on multiple platforms, such as E-

For example, an APM application can automatically discover components of an enterprise E-mail system spread across the mainframe, a Windows NT server and clients, and then build views of those components and monitor them for problems. Corrective action can then be taken by administra-

The APM is based on Tivoli's Applications Management Specification, a Desktop Management Task Force Desktop Management Interface-compliant specification that defines an open, standard way of creating management applications.

GEM will be available in December. Pricing has not been

©Tivoli: (512) 436-8000.

Windows gains broader array of management wares

By Jim Duffy

Two management vendors have unveiled products that provide security and monitor network health from Windows workstations.

Axent Technologies, Inc. last week rolled out two software packages designed to enforce security policies and detect intrusion of Windows 95 desktops. And Technically Elite, Inc. unwrapped a 32-bit Remote Monitoring 2-like monitoring application for Windows 95 and Windows NT workstations that analyzes data collected by the company's new RMON2-like probe.

Axent's OmniGuard/Enterprise Access Control software for Windows 95 (EAC/95) allows administrators to define desktop and notebook computers' security parameters at a central work-

station and then deploy them networkwide. For instance, administrators can define multiple user accounts that require authentication before access to the workstation is granted.

AXENT ON SECURITY Intruder Alert -Monitors securityrelated events, analyzes audit trails and alerts administrators to suspicious activity.

Enterprise Access Control -Provides secure identification and authentication for users of Windows 95 workstations.

EAC/95 also provides data security through file-level access controls and encryption.

To thwart intruders, Axent unveiled OmniGuard/Intruder See Axent, page 18

Kentrox taps packet bandwidth

By Tim Greene

Portland, Ore.

ADC Kentrox has a way for large frame relay users to keep up with the ever-increasing bandwidth of packet services, which is now soaring to 45M bit/sec.

In December, Kentrox will

introduce a DS-3, 45M bit/sec frame relay module for its AAC-3 ATM access concentrator. The module will enable corporate users to drop remote and legacy traffic onto a single large frame relay link for their hub sites.

The concentrator is designed to take in multiple traffic types and pump ATM traffic out the back.

But with the new module, the concentrator can interface to a corporate site with a public frame relay network.

The December ship date will coincide with the earliest DS-3 frame relay service offerings from regional Bell operating companies (NW, Oct. 21, page 1). With some interexchange carriers already offering similar services, frame relay will be available to suit network topogra-

phies of even the highest bandwidth users. That gives the users a broadband wide-area alternative to ATM.

Particularly attractive to highbandwidth, data-only networks, frame relay at T-3 speeds would be more efficient than ATM cell transport. That is because

Access concentrator beefed up

The ADC Kentrox 45M bit/sec frame relay module, in conjunction with other modules, lets its AAC-3 access concentrator be configured to:

- Concentrate frame relay traffic within large
- ▶ Deliver high-speed frame relay Internet access
- Provision backbone trunking between frame relay switches

frames use less bandwidth for addressing than cells, said Steve Taylor, president of Distributed Networking Associates Greensboro, N.C.

But for broadband users that want to mix in voice and video traffic, ATM is probably still the way to go, Taylor said.

People used to think frame relay topped out at 1.5M bit/sec T-1 speeds, but there was never a technical limit. Frame relay was

See Kentrox, page 18

INTERMETWORKING MONITOR

The choice is yours: Get on the 'Net or polish up your resume

ne thing is clear to network managers: If you don't install the Internet connection, your replacement will. So powerful is the allure of the 'Net that top management is pushing - or even

demanding - the connec-

Every day, the T-1 link between corporate headquarters and the Internet increasingly becomes a given, for organizations both large and small. The question, then, is not if or when the Internet will be used, but how it will be used. Specifically,

what level of integration should be envisioned for the corporate private net and the Internet? There are at least two lines of thinking on the subject. Let's label these approaches "connection of convenience" and "strategic building block."

The former runs something like this: While the Internet connection (for better or worse) is a reality, it has no strategic significance vis-a-vis the corporate private net. The Internet connection is ancillary,

and it will remain so.

The bit of the Internet that reaches into headquarters will, naturally, be used to host the corporate Web site and, perhaps, a File Transfer Protocol (FTP)

> server. The connection between the 'Net and the corporate net, where one exists, is limited and guarded. Perhaps the only critical role of the connection is as a transport for the Simple Mail Transfer E-mail Protocol between the internal E-mail system and the outside world.

In terms of traffic, the Internet-private net connection is truly one of convenience because most of the traffic is likely created by corporate employees surfing the World-Wide Web and pulling files down from distant FTP sites. Simply put, enterprise-level, mission-critical network functions, such as providing remote access to the field sales force, will not be considered candidates for migration to the Internet. Case closed.

The other view: The possible benefits

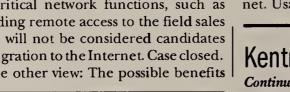
of the Internet — technological and economic — put it in potential competition with the existing private corporate network on almost every front. The bold (and probably foolish) could even replace their entire corporate network with an Internet-based virtual private network. Next-generation corporate networks will have at least some strategic component delivered via the Internet. This latter view is quite compelling.

You might not want to build a virtual private network on the anarchic Internet, but what about supporting the field sales force and small office/home office (SOHO) users? Instead of acquiring, installing, maintaining and managing a bank of dial-up access gear, let your Internet service provider do it for you. The traffic comes to corporate via the Internet connection you are already paying for.

Economically, you can't beat the Internet. Usage is close to free. In theory, you could keep a SOHO site online to headquarters via a local ISP at 28.8 or 33.6 bit/sec, 24 hours a day, seven days a week for \$19.95 per month — a few cents per hour. You'll pay the telephone company more than that just to have the dial-up phone line. The Internet turns the traditional usage-based connectivity model on

So tell me what you think and why. Should the Internet connection be considered a connection of convenience or a strategic building block? Is the Internet inherently unstable, both economically and technically, and a must to avoid? Or, is it a next-generation solution that only those blind to progress would ignore?

Tolly, NW's new WAN columnist, is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (908) 528-3300 or ktolly@tolly.com.



Kentrox

Continued from page 17

held to lower speeds in the market, though, because of scant user demand for more bandwidth, and because ATM was

Higher bandwidth

frame relay services

let users reduce the

number of frame

relay ports at their

large sites and

require no retrain-

ing in ATM.

effectively touted as the best answer for higher bandwidth

Now users, vendors and carriers are acknowledging that higher bandwidth frame relay services are attractive. That's because they let users reduce the number of frame relay ports at their large sites and require no retraining in

Both users and service providers can employ the new module. Service providers

are looking at it as a way to help provision public T-3 frame service.

Pacific Bell Network Integration

(PBNI), a subsidiary of Pacific Bell, expects to use the Kentrox DS-3 frame relay module as customer premises equipment (CPE) when it becomes available.

As CPE, the module would interface with routers, servers and other local leg-

> acy devices as a link to the wide area, said Richard Brennan, a product manager for PBNI.

> Kentrox said the lack of frame relay-to-ATM service interworking makes the new interface practical. If that type of service were available, remote sites linked to their headquarters by smaller frame relay links would be fed to central sites over a single ATM pipe.

> The AAC-3 access concentrator costs between \$6,500

and \$55,000, depending on configura-

OADC Kentrox: (800) 232-5879.



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Circle Reader Service #24

Axent

Continued from page 17

Alert (ITA) Version 2.3 for Windows NT. The release of ITA allows users to monitor and correlate security-related events across Unix, NetWare and Windows NT environments to detect unauthorized or attempted use of computing resources.

EAC/95 costs \$139 per workstation and is available now. ITA 2.3 costs \$995 for agents and \$1,995 for the graphical user interface (GUI). It will be available in November.

Technically Elite also supports a Windows-based GUI for its new RMON2-like MeterWare network monitoring application. MeterWare for Windows 95/NT Version 5.0 allows users to monitor all seven layers of network traffic, up to and including the application layer, Technically Elite said. With that information, users can view and generate reports on conversations between devices as well as on the distribution of all protocols on the network.

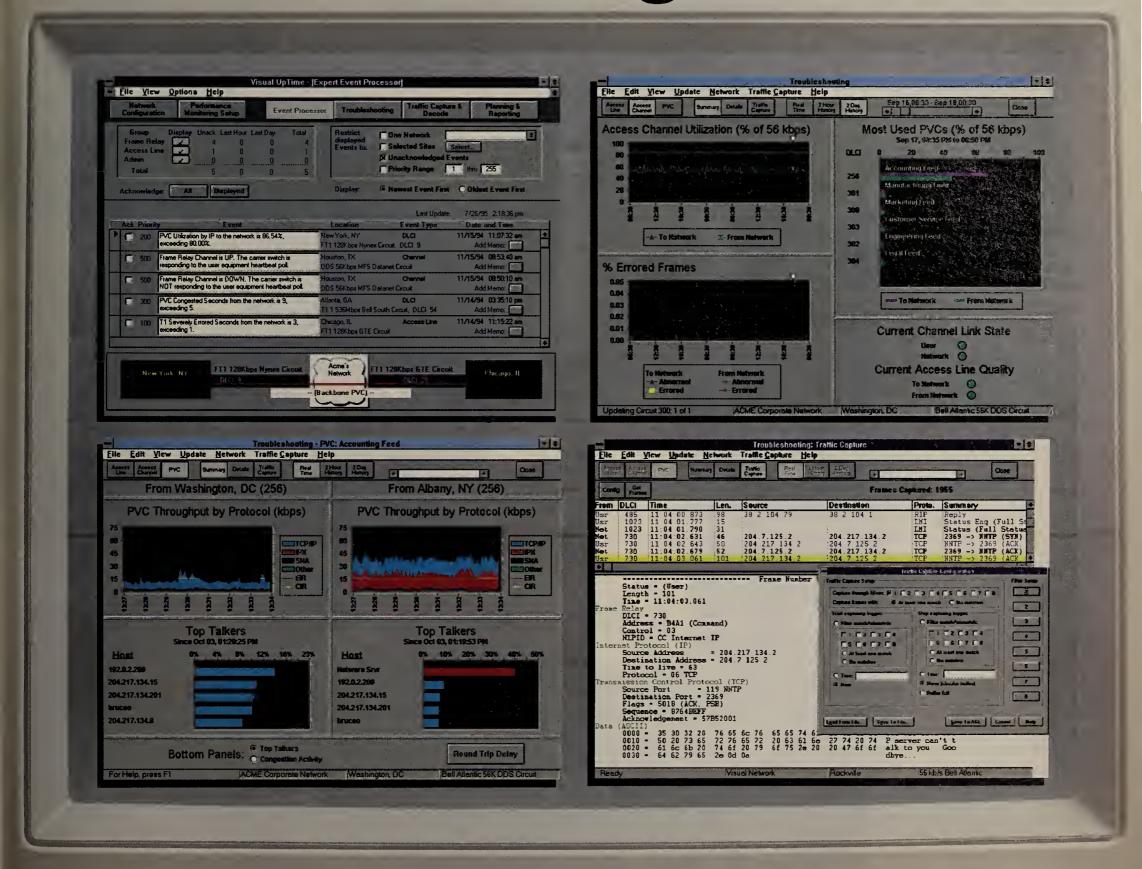
To help collect RMON2-like statistics, Technically Elite rolled out MeterWorks 4.0 for its line of Intel Corp. i960-based probes. This software supports all of the RMON2 groups defined by the IETF, as well as user-definable protocols and a single network-layer view for all media access control-layer encapsulations.

MeterWare for Windows 95/NT 5.0 and MeterWorks 4.0 will be available in November. Technically Elite is offering both individually at an introductory price of \$1,495.

OAxent: (301) 258-5043; Technically Elite: (408) 574-2300.

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Briefs

tions Commission last week officially opened its national call center to field questions and complaints about carrier services. Leasted in Cottachura

vices. Located in Gettysburg, Pa., the center's number is (888) 225-5322, devised to spell out (888) CALL-FCC. The center opened several months ago but had only been fielding calls from selected states.

■ Apparently, two and a half years is not long enough to achieve local telephone number portability. US WEST, Inc.

has asked the Federal Communications Commission for a three-month

extension



on the recently established Dec. 31, 1998, deadline for achieving database local number portability. US WEST said that because it will be testing portability next summer, it is not sure it can meet the interim deadline of Oct. 1, 1997, for achieving portability in certain markets and, therefore, needs to have the entire schedule pushed back.

- ■AT&T said it will introduce E-3 access capability to its overseas network in response to customer requests. Europeanstandard E-3 transmissions run at the rate of 34M bit/sec, compared to the North American T-3 standard of 45M bit/sec.
- ■After Nov. 30, AT&T calling cards will not be honored by **BellSouth Corp.** for local and long-distance calls — part of AT&T's continuing severance of agreements with local exchange carriers (LEC). With agreement in place for AT&T and LECs to honor each other's cards, the carriers share revenue from each call handled on the other's network. But AT&T has been canceling those arrangements, hoping customers will use 800 numbers that tap the AT&T network directly, allowing AT&T to retain all the revenue.

Rocket scientists launch voice-over-frame link

By David Rohde

Germantown, Md.

Don't tell Chuck Bace that frame relayisn't rocket science.

As manager of information systems for Orbital Sciences Corp.'s Space Systems Group, Bace really does have to satisfy the networking needs of rocket scientists.

But he has to do it economically. So when he began installing PictureTel Corp.'s LiveLAN desktop videoconferencing system earlier this year to let his space engineers conference

manent virtual circuit. That adds \$1,088 to the monthly bill. But because LCI lets users aggregate frame relay costs with ordinary toll traffic, Bace earns a 30% to 40% frame relay volume discount.

LCI frame relay points of

LCI frame relay points of presence are outfitted with Newbridge Networks, Inc. frame relay switches from the vendor's MainStreet series of bandwidth managers. "We don't need routers — we're completely switchbased," said Mack Greene, an LCI applications engineer in Washington, D.C.

To keep access costs down, LCI does not charge Orbital Sciences the full distance between customer premises and POPs. Instead, LCI maintains 477 geographical pricing points around the country — many of them so-called virtual POPs located

three to five miles from suburban business centers.

Bace conceded that Orbital Sciences managers raised some questions about giving such an advanced data service to a relative unknown like LCI. But those doubts disappeared when they saw LCI Chairman Brian Thompson in one of his trademark cable television commercials.

"They said, 'Well, if [LCI] has enough money to go on television, they must be okay,' "Bace said.

I SEE YOU OVER FRAME RELAY

For Orbital Sciences, 384K bit/sec of frame relay capacity supports a dial-up desktop videoconference with a voice conversation.



Check out white papers that describe different vendors' approaches to multimedia over frame relay.

NetworkWorld

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http://www.nwfusion.com

each other at will, he wanted to avoid a budget-busting dedicated WAN connection.

The solution was the Frame-Plus service from long-distance carrier LCI International, Inc. Bace purchased 384K bit/sec frame relay ports from LCI near his two key locations here and in Pomona, Calif. Now Orbital Sciences runs ordinary LAN applications over the frame relay link and spikes up to the video bandwidth as needed.

Orbital Sciences could have installed PictureTel's ISDN dialup system, but that would have run up carrier toll charges. "The reason we went with [Picture-Tel's] LAN system rather than ISDN is that we wanted to make use of an existing [WAN] infrastructure," Bace said.

LCI charges \$430 per month for each of the two 384K bit/sec frame relay ports, compared to the thousands or tens of thousands of dollars it would cost for a high-capacity cross-country private line.

To accommodate the video application, Orbital Sciences' WAN design includes a hefty 256K bit/sec committed information rate on the two-way per-

NYNEX preps 1 million new lines

By Tim Greene

New York

NYNEX Corp. is starting to resemble a cable TV company.

Starting early next year, NYNEX will build a fiber and coaxial cable network capable of delivering broadband services to about one million customers in the New York and Boston metropolitan areas.

That is the same architecture used by cable TV companies, but with a new twist: The coaxial cable NYNEX is installing carries two copper voice phone loops inside the same sheath.

That will enable the carrier to continue delivering voice phone service in the traditional way and also offer the broadband services its competitors are starting to deliver over cable modems.

As part of the plan, NYNEX will push fiber into neighborhoods where optical electrical nodes will feed between eight and 16 customers.

The NYNEX strategy differs from those of other regional Bell operating companies, which

lean toward Asymmetric Digital Subscriber Line (ADSL) to deliver widespread broadband services. ADSL runs over installed copper phone lines.

Fiber plans

Starting in early 1997, NYNEX will push broadband closer to customers in the New York and Boston metropolitan areas with features such as:

- Fiber to the curb
- ► "Siamese" cables containing both copper wires and coaxial cable to the end user
- ➤ Capacity to offer voice phone service, ISDN and high-speed data to support Internet access and video services

NYNEX sees ADSL as an interim technology that will be employed for five years or more as NYNEX installs the new local loops, according to Walter Silva, vice president of broadband.

The carrier hopes to have 30,000 lines installed by the end of next year and will initially test to assure the lines deliver plain

old telephone service reliably. After that, it will test video and data services. Video service will require installing Synchronous Optical Network (SONET) rings to connect local central offices with others containing the ATM switches that will route video traffic, Silva said.

The NYNEX choice is much more expensive to install than the ADSL alternative, said Steve Sazegari, directing manager of Tele.Mac, a telecommunications consulting and engineering firm in Foster City, Calif.

If sold in bulk, ADSL gear could cost as little as \$500 per line. One ADSL vendor said the cost per line will be \$800 to \$1,000 at this time next year. A copper-coaxial drop costs \$1,800 to \$2,000, Sazegari said.

The NYNEX upgrade would push fiber from central offices to local nodes that feed eight to 16 households. From the nodes, services would be transported over the copper-coaxial or "Siamese" cables. The necessary gear consists of a node unit that does electrical-to-optical conversion, and a host terminal in the central office to separate traffic.





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Briefs

■ Advanced Logic

Research, Inc. (ALR) last week announced an external RAID system for its Pentiumand Pentium Pro-based Evolution Series workstations and Revolution Series servers.

The ALR DataStation-8 supports eight hot-swappable disk drives, offering up to 72G bytes of

data storage. The Data-Station-8 features five cooling fans and three hot-swappable



power supplies. It is priced at \$4,559 and is available now. ALR: (714) 581-6770.

■ Advanced Digital Information Corp. (ADIC) is shipping a desktop tape library (DTL) with 1.26 terabytes of storage capacity.

The Scalar 218, with an 11inch high, 19-inch wide chassis,
can be fitted with as many as 18
DTL cartridges for backing up
databases such as Lotus Notes
servers and mail servers. The
library keeps its trim figure by
using a double-row cartridge
configuration. A robot arm
moves between the two rows and
picks cartridges from either side.

The Scalar 218 will be available Nov. 15 and is priced starting at \$14,895.

ADIC: (800) 336-1233.

week released its 1996 thirdquarter earnings report, which showed revenues to be down by more than \$3 million over the same period last year. Revenue for third-quarter 1996 totaled \$28.1 million vs. \$31.2 million in 1995's corresponding quarter.

The Westborough, Mass.-based company also took a quarterly loss of \$783,000.

Novell drives for 'Net printing standard

of LDPA, end users will be able to

Protocol would let end users access printing devices across the Internet, intranets.

By Christine Burns

Orem, Utah

Novell, Inc. last week unveiled plans to propose a standard protocol for printing across the Internet and corporate intranets.

This protocol, dubbed the Lightweight Document Printing Application (LDPA), could be integrated into desktop and network operating systems, supported by printing management software and embedded in printing devices.

With widespread acceptance

send jobs to printers regardless of their geographic location. Administrators will be able to easily manage compliant printing devices and grant access across the World-Wide Web.

With support from a slew of printing industry vendors—

With support from a slew of printing industry vendors — which International Data Corp. (IDC) estimates comprise more than 95% of the printer industry market share — Novell next month will submit a draft proposal of LDPA to the Internet Engineering Task Force.

"Printing has been largely ignored in the growth of the Web, and it's an area that is ripe for new possibilities," said Marc Epstein, vice president and general manager of Novell's Network Services Division. While Epstein declined to give details about how Novell will fit LDPA into its product line, he indicated that the protocol would likely be supported in the company's distributed print and directory services.

LDPA is an Internet exten-

sion to an existing ISO standard called Document Printing Application (DPA), which is supported in several print management services, such as Hewlett-Packard Co.'s Distributed Print Services and IBM's Print Systems Manager.

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While DPA is a robust protocol stack and addresses many printing compatibility issues in the Unix world, LDPA is streamlined to focus on a universal means of submitting and distributing printjobs over the 'Net.

The emergence of LDPA comes at a time when vendors increasingly are taking existing

Vendors unite on the data storage front

print services and printer management software and porting them to work over the Internet, said Paula Bursley, industry analyst with Giga Information Group in San Jose, Calif.

"There is a definite need to bring in a standard, because if you are looking at a wider network of equipment and you want to be able to send a print job anywhere, there has got to be a commonly accepted means of doing that," she said.

The vendors supporting this effort include Adobe Systems, Inc., Canon U.S.A., Inc., HP, IBM, Intel Corp., Ricoh Company, Ltd., Sharp Corp. and Xerox Corp. The Multi-Function Peripheral Association has also committed to endorsing the proposed protocol.

Industry observers estimate that getting a draft proposal accepted as an Internet standard could take anywhere from six to 18 months. However, based on the fact that LDPA is already grounded in DPA and given the market pressure to produce this Internet printing capability, acceptance of this standard is likely to speed that process, said Allyson Frasco, a senior research analyst with IDC.

McAfee grapples with groupware virus detection

By John Robinson

Santa Clara, Calif.

While collaborative computing helps spread information throughout an office environment, applications such as Lotus Development Corp.'s Notes can also inadvertently spread viruses forwarded as file attachments.

To combat this, McAfee is setting its sights on groupware virus protection with two products to protect Notes networks.

The company last week released GroupScan and GroupShield for Notes desktops and servers, respectively. The products scan Notes-encrypted files on demand or automatically to protect against Notes-specific macro viruses.

If a virus is detected, files can be cleaned or sent to a database for review.

McAfee expects Lotus, a business partner, to endorse the product.

"It's not an indictment of Lotus or Notes," said Scott Gordon, senior product manager for McAfee. "Any collaborative dynamic environment supports viruses."

Helen Flynn, an analyst at Gartner Group, Inc. in Stamford, Conn., said the primary See Groupware, page 8L By John Robinson

A group of 15 data storage and management companies have banded in support of a protocol that ensures interoperability between different file servers, tape drives and data managements of tware.

The Network Data Management Protocol (NDMP) — scheduled for presentation to the Internet Engineering Task Force (IETF) today — should eliminate the need for vendors to port their data management software to different combinations

of file servers and storage

Developed jointly by Network Appliance, Inc. and Peripheral Devices Corp., NDMP was designed specifically to support tape drives in a client/server model.

Under the protocol, file servers fitted with an NDMP universal agent can be managed by any NDMP-compliant backup application.

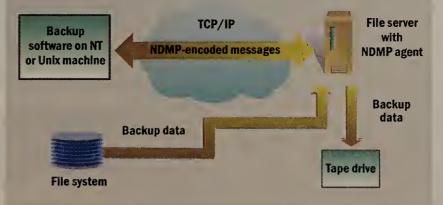
The management software initiates the backup, and the server draws the data from a file system such as a disk drive and transfers the data to an NDMP-compliant tape drive (see graphic).

If a tape drive is not locally attached to the server, the data can be sent as messages back across the network to a tape drive attached to the server running the backup software.

See NDMP, page 9L

NDMP ARCHITECTUAL MODEL

In a basic configuration, the backup software sends encoded messages over the network to back up data from the file system to a tape drive connected to the file server.



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RightFAX reaches the 'Net

Windows NT-based software works with Microsoft's IIS Web server.

By Christine Burns

Tucson, Ariz.

RightFAX, Inc. has unveiled a Windows NT Server module that will give end users direct access to its LAN-based fax servers over the Internet.

The software will give users equipped with a Web browser easy access to information stored on these LAN-based RightFAX fax servers, regardless of the users' location or desktop platform.

The RightFAX Web Client sits on a Windows NT Server 3.X or 4.0 system that is also running Microsoft Corp.'s Internet Information Server (IIS) Web server software, according to Oscar Fowler, lead engineer for the product. Despite the product's name, it does not include a client component.

End users point their browser to a RightFAX Web page sitting on IIS and log on via a user identification and password sequence. When authentication is complete, the Web server sets up a link to a RightFAX fax server, which can be running on either a Windows NT Server or OS/2 Warp Server machine.

A remote user can send, receive, forward, route, delete and print faxes as if the user were sitting at a local workstation. When a user attempts to open a fax document, the new module converts the .TIF file into an HTML document, which is then fed back to the browser for viewing.

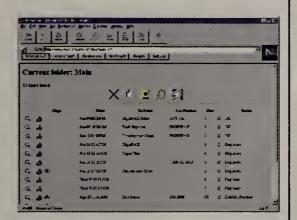
Document security is handled via the Secure Sockets Layer technology support built into IIS.

Analysts said the offering will be attractive to companies providing end users with remote access via the 'Net.

"Extending their LAN-based fax services infinitely across the Internet is becoming more important as users are

demanding access to all types of information from wherever they may be," said Pete Davidson, president of Davidson Consulting, Inc. in Burbank, Calif.

While end users will get better access to fax information, administrators will also benefit in that they will not need to maintain remote client software.



RightFAX introduced a Windows NT Server-based module that lets remote end users use aWeb browser to tap into their LAN-based RightFAX modems.

In addition to providing real-time fax services to remote users via the 'Net, the Web Client gives all types of clients access to RightFAX servers on a corporate intranet, as well. RightFAX currently only ships with Windows client software, but the Web Client module opens up that access for local Macintosh and Unix clients that are running browsers.

The RightFAX Web Client is currently in beta. The module will be available in December and will cost \$1,295 for an unlimited-user license.

Down the road, the module will support Web servers other than IIS, said Joe Cracchiolo, RightFAX vice president of research and development.

©RightFAX: (520) 327-1357.

Microsoft dumps MIPS platform for NT

By Christine Burns

Redmond, Wash.

Microsoft Corp. has announced plans to phase out future development of workstation and server versions of Windows NT for machines based on MIPS Technol-

ogies, Inc. Reduced Instruction Set Computing hardware.

The decision was driven by a lack of demand for MIPS-based systems from key OEM manufacturers, according to Windows NT product manager Phil Holden. MIPS-based machines comprise less than 1% of all RISC systems shipped with Windows NT, and the bulk of that installed base exists in the Japanese market, Holden said.

WINDOWS NT ON MIPS

The Installed base of MIPS
systems running Windows NT
entering 1996 was 23,000
units, a small share of the 1.5
million units of Windows NT
installed overall, according to
International Data Corp.
Another 7,000 MIPS-based NT
systems have been installed
so far this year.

NEC Corp., Microsoft's largest Windows NT OEM partner for this platform, also announced it will not enhance its MIPS-based servers and workstations after the Windows NT 4.0 release. An NEC spokesman said the company is

dropping future MIPS development to focus on its Intel-based ProServa machines.

This move will have little or no effect on future Windows NT sales, said Neil MacDonald, senior research analyst with Gartner Group, Inc. in Stamford, Conn. "NT on any platform other than Intel is a niche market, and MIPS was a niche of that niche," he said.

See MIPS, page 8L

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Amdahl shoots for bigger server role

Adds connectivity and security enhancements to its Millennium line, rolls out lower end models.

By Michael Cooney

Sunnyvale, Calif.

Amdahl Corp. — best known for its mainframes — is trying to make a bigger

name for itself in the high-end server market.

The company last week announced connectivity and security enhancements

to its existing mainframe-class Millennium servers. In addition, it introduced a line of lower end servers.

Amdahl generally targets large IBM

System/390 shops with multiple data centers and mainframes, but the new models will enable the company to appeal to a more traditional high-end server custom-

"We are offering an alternative to lowend IBM mainframe and general highend servers," said Ali Jenab, director of marketing for Amdahl.

Millennium servers are IBM S/390compatible and run on CMOS-based pro-

Amdahl executives envision the large and small Millenniums in a variety of roles, from application development platforms to distributed database servers.

One way Amdahl is trying to make its servers more attractive is by improving their connectivity capabilities. Key to this strategy are new Open Systems Adapter cards, which allow direct LAN connectivity and support for IBM SNA/Advanced Peer-to-Peer Networking and TCP/IP traffic.

Initially, each card can support two full-duplex Ethernet or one FDDI LAN attachment, and a maximum of 16 OSAs can be supported per server. Both features will be available in late 1997.

The boards can also support a 155M bit/sec ATM link, though this feature will not be available until 1998.

For improved redundancy, Amdahl added Dynamic QuickSwitch software to its servers, letting customers switch work from one CPU to another without having to take the server down. QuickSwitch can also dynamically switch traffic among mainframe channels should a failure occur. These options will help users upgrade to new CPUs faster, as well as recover from failures much quicker,

QuickSwitch will be offered by year-

Amdahl has also improved server security with Host Security Modules (HSM), codeveloped by Racal Data Group. These offer public key encryption, facilitating secure electronic commerce and other transaction processing applications, Jenab said.

The modules reside in a separate hardware device that is channel-attached to the Millennium server via an Ethernet

Given that existing Millennium servers are overkill for some customers, Amdahl is rounding out its server line with five lower end models. They range from the single CPU Model 415 to the three-processor Model 425.

Three of the new models function as stand-alone servers and two — the Models 415 and 425 — can be attached to each other via Amdahl's Coupling Server technology for improved redundancy and throughput.

"These are 45- to 85-MIPS machines capable of handling small to mediumsized workloads," Jenab said. "In the past, our smallest machine was a 118-MIPS

The servers will be available by yearend. No pricing was announced.

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Notwork management

Asante puts Web spin on multivendor mgmt.

By Jodi Cohen San Jose, Calif.

Switch and hub maker Asante Technologies, Inc. last week introduced a Web-

based application for managing any vendor's SNMP-based network device.

The Windows NT application, dubbed IntraSpection, allows network managers

to locate, correct and track net problems from any client on the network equipped with a Web browser.

The software should eliminate the

need for companies to learn and use different net management tools for each device in their network, according to Paul Smith, vice president of marketing at Asante.

Products such as Bay Networks, Inc.'s Optivity and 3Com Corp.'s Transcend net management platforms focus exclusively on their respective company's devices. Then again, offerings such as Hewlett-Packard Co.'s OpenView and Cabletron Systems, Inc.'s Spectrum support competitors' products.



Asante's IntraSpection provides net managers with port-level net traffic statistics for just about any vendor's hub or switch.

One key differentiator with Intra-Spection is that Asante is offering plug-in "personality modules" that provide customized support for individual devices, including the LinkSwitch 1000 from 3Com and Bay's 2800 stackable Ethernet

Asante also plans to offer modules for hubs and switches from Cisco Systems, Inc., Cabletron and others.

How it works

Because of this multivendor approach, net managers can get a cohesive picture of the network using IntraSpection.

When any vendor's network device experiences a problem, it sends an SNMP error message to the IntraSpection Trap Manager, which captures and logs the problem through a Windows-based database interface. The net manager can access the error log and view system events

Key features include IntraSpection's Map Manager, which discovers all SNMP-based devices and displays a map of the entire network.

The software also uses Java technology to deliver real-time network status monitoring, statistical graphs and tables, and problem reports.

IntraSpection also allows users to develop a customized device management system using an HTML page, as opposed to other products that require knowledge of more complex C and C++ programming languages, Smith said. Customers may create their own management modules or use the personality modules offered by Asante.

The IntraSpection software will be available to download for free from the Asante Web site at www.asante.com in mid-November. Personality modules are priced at \$99.

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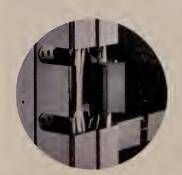
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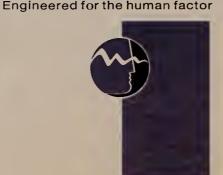
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Digital reports first-quarter loss

By Rebecca Sykes

Maynard, Mass.

Digital Equipment Corp. last week announced a first-quarter loss of \$66 million, a turnaround from the earnings of \$48 million posted for the first quarter last year.

Revenue for the quarter was also down. It fell to \$2.9 billion from \$3.2 billion in the first quarter last year, officials said.

Commenting on the first-quarter loss, Digital Chairman Robert Palmer said in a prepared statement that the implementation of a new sales model got a historically slow quarter off to an even more sluggish start.

Though the first-quarter loss is significantly less than Digital's fourth-quarter loss of \$433 million, one observer said he saw a dispiriting trend at the company, based here.

The loss "is not out of the ballpark with my expectations, but what's more concerning to me is an excuse du jour every quarter," said Jon Oltsik, an analyst with Forrester Research, Inc. in Cambridge, Mass.

Another analyst said she is not giving up hope on Digital.

"It's not as if their core strategy is off

Microsoft keeps momentum going

By Elinor Mills

Redmond, Wash.

Microsoft Corp. last week cited strong sales of its Windows 95, Windows NT Server and BackOffice software in reporting first-quarter earnings of \$614 million for fiscal 1997 — a 22% jump over earnings of \$499 million for the same period last year.

Revenue for the quarter that ended Sept. 30 was \$2.3 billion, up I4% from \$2.02 billion in revenue recorded in the first quarter a year ago.

The reasons for the strong showing are many, analysts said.

"A lot of fairly large and expensive Exchange deployments have gone in, and coupled with Windows NT Server, [Microsoft is] moving strongly toward minimal competition in the server space and virtually no competition on the desktop," said Rob Enderle, an analyst at Giga Information Group.

Microsoft also has new products emerging to keep the momentum going, Enderle added.

"They've been absorbing costs on Normandy, but haven't generated any revenue yet because it's not on the market," he said. Normandy is the code name for Microsoft's pending enterprise Internet software.

Companies are also waiting for Release 4.5 of Exchange, the first service pack for See Microsoft, page 8L the wall," said Susan Frankle, an analyst with Framingham, Mass.-based market research firm International Data Corp.

Digital is focusing on high-performance 64-bit computing, Windows NT

across both Intel and Alpha platforms, and Internet connectivity within and across corporations, which is a solid strategy, Frankle said.

But Oltsik said Digital should be doing better, given the market. "There are certainly opportunities out there" that other companies have found, such as Sun Microsystems Computer Corp.'s penetration of the enterprise market with its Ultra Enterprise servers, he said.

The enterprise market "is a market that Digital should do well in, but they're not doing as well as they could," Oltsik said

Sykes is an IDG News Service correspondent in Boston.



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LAN requirements and situations which

wiring, such as: temporary workgroups

don't lend themselves to traditional

manufacturing facilities, warehouses

and older buildings.

Groupware

Continued from page 1L

benefit of GroupShield and GroupScan is that both products scan for macro viruses, which have proliferated in networks over the past year.

"The macro virus has been widely recognized for causing significant problems

in large organizations," she said. "They are primarily transferred in Microsoft Word documents...and Notes databases are a place where you find those as attachments to files."

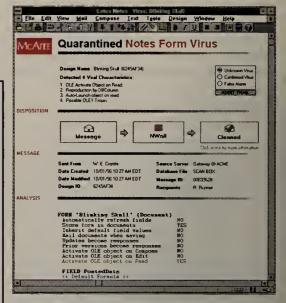
Virus protection in collaborative environments had not been directly addressed before the new McAfee products, Flynn added.

McAfee next year will release antivirus products for Microsoft Corp.'s Exchange and Novell, Inc.'s Groupwise.

GroupScan and GroupShield support Notes 3.X and 4.X on OS/2, Windows 3.X, Windows 95, NT and NetWare.

Evaluation versions of both products can be downloaded from www. mcafee.com beginning Oct. 31. GroupScan, priced at \$30 per node, and GroupShield, priced at \$600, will begin shipping next month. Site li-censes will also be available.

©McAfee: (408) 988-3832.



GroupScan sends viruses to a quarantined database where they can be reviewed.

Microsoft

Continued from page 7L

Windows NT 4.0 and the recently announced version of Windows for handheld devices, Enderle noted.

This was the first time Microsoft sold more 32-bit applications than 16-bit applications, said Greg Maffei, treasurer and corporate development vice president.

Other highlights for the quarter included the release of the Publisher 97 Web authoring tool in 11 languages, the launch of the MSNBC news offering, the shipping of Internet Explorer 3.0, and the recent beta releases of Unix and Windows 3.1 versions, Maffei said.

Mills is a correspondent with the IDG News Service's San Francisco bureau.

MIPS

Continued from page 3L

A big strike against Windows NT running on MIPS hardware is the lack of application support. While NT-based MIPS machines can exist on the same net as their counterparts on Intel- or Digital Equipment Corp.'s Alpha-based machines, applications must natively support NT/MIPS servers and workstations to run on them, Holden said.

"Although non-Intel vendors, such as Digital with the Alpha platform, are discussing emulation strategies for running these Intel-based NT applications, the performance hit would negate the value of having a RISC-based NT strategy to begin with," MacDonald said.

Microsoft will continue to support customers that run Windows NT 3.X and 4.0, as well as all of its BackOffice applications, on MIPS machines. However, the company will not release any further service packs or patches for either version of the operating system on this platform.

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BusinessBriefs

Cabletron Systems, Inc., the
Rochester, N.H.-based hub and
switch vendor, has named Stephen
Gray director of worldwide marketing and communications. He will
oversee all aspects of the company's global marketing and communications efforts, including
strategic marketing, advertising
and public relations. Gray comes
to Cabletron from Digital Equipment Corp., where he held several executive marketing positions.



Gray was named Cabletron's director of worldwide marketing and communications.

Also joining Cabletron is **Ken Sullivan**, as director of service and support operations. He will be responsible for managing all aspects of the company's technical support operations. Sullivan most recently worked for Intergraph Corp., where he was executive vice president of service and support, as well as the company's chief information officer.

ATM switch provider **FORE Systems, Inc.** last week revealed its steady growth when the company announced financial results for its second fiscal quarter ending Sept. 30. Revenue for the second quarter of fiscal 1997 totaled \$98 million, an increase of 88% from the \$52 million reported in the same period last year. Earnings were \$13.3 million, almost twice that reported in the second quarter last year.

The company attributed its strong results to sales of its ATM gear for the core of the network and Ethernet switches out at the net edge.

Gigabit Ethernet start-up Packet Engines, Inc. has welcomed three additions to its management team. New recruit Barbara Flske comes on board as general counsel and vice president of administration. She previously served as senior attorney for Intel Corp., with responsibilities for securities compliance and disclosure, stockholder relations and risk management.

Also joining the company is **Pete Price**, director of finance and corporate controller. Price comes from Microsoft Corp., where he was responsible for financial management, planning and control of the U.S. and Canadian subsidiaries.

On the technical side of the house, **Octavio Morales** signed on with Packet Engines as director of product management. Morales previously was in charge of product development for Fibre Channel tranceivers at Symbios Logic (formerly NCR Corp.).

Whittaker Corp. has announced the resignation of Thomas Brancati, president and chief executive officer, for personal reasons.

Whittaker has designated **Joseph Allbrandi** to succeed Brancati as CEO in addition to his duties as chairman.

Alibrandi previously served as CEO of the company from the early 1970s until Brancati was appointed to that position in 1995.

NDMP

Continued from page 1L

Products supporting NDMP could appear in 12 months if the protocol moves quickly through the IETF approval process, said Rich Boberg, senior director of corporate strategy at Network Appliance.

Companies supporting NDMP are BEI

Corp., Cheyenne Software, Inc., Comm-Vault Systems, Inc., OpenVision Technologies, Inc., Spectra Logic, Workstations Solutions, Inc., ATL, Breece Hill Technologies, Inc., Compact Devices, Inc., Cyber-Storage Systems, Inc., Falcon Systems, Inc. and Invincible Technologies Corp.

However, Legato Systems, Inc. — a large player in the Unix backup market —

is not behind NDMP. Supporting NDMP "would be a step backwards for us," said Paul Zuhorski, product manager for Legato's Unix line. "With our products, you can have data sources saving to any number of tape drives at once, and you can't with [NDMP]. If we supported it, we'd lose that key technology, and it would give our competitors a chance to catch up."



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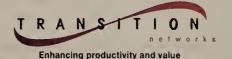
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Discussing the politics of software

he political phrase "co-opting the center" refers to a politician's attempts to hold onto that part of the elec-

torate whose ideology is the same as his, while stretching toward the other side just enough to capture the support of those who define themselves as somewhere between liberal and conservative.

On the U.S. political scene, President Bill Clinton has shown himself to be an adept practitioner of this strategy. In the world of computers, Microsoft Corp. CEO Bill Gates and his company are the masters, though the Sun Microsystems, Inc./Oracle Corp./Netscape Communi-

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cations Corp. (SON) coalition shows signs of trying to utilize the strategy, as well.

Throughout its history, Microsoft has watched each new release of an operating system or application from other companies and gathered statistics on which utilities, add-ons and macros were purchased or downloaded by customers. Similar functionality then shows up in the next release of the Microsoft product.

A year ago, Microsoft didn't care about the Internet or intranets. Six months ago, the company was pushing ActiveX as an alternative to Java. This month, Microsoft released the Software Development Kit for Java. And it's free! What more could a developerask for?

I said the SON people are learning, though, and here is some evidence.

Oracle, prime mover of the network

computing device, finally released its specification. turns out that your basic Intel Corp. processor-based computer, when equipped with Windows 95 or Windows NT, is a perfect fit Dave Kearns for the spec. Co-opt



the Wintel base, and there's little left to organize an effective opposition to the spec — or so Oracle's thinking goes.

Sun's move is a bit more technical. Java relies on the availability of programmed objects when an application calls for them. The two sides vying to define the architecture for distribution of objects are Microsoft with its Distributed Common Object Model (DCOM) and everyone else with Common Object Request Broker Architecture (CORBA).

Sun, which has captured the lead in all things 'Net/intranet aside from browsers, relies heavily on Java and recently

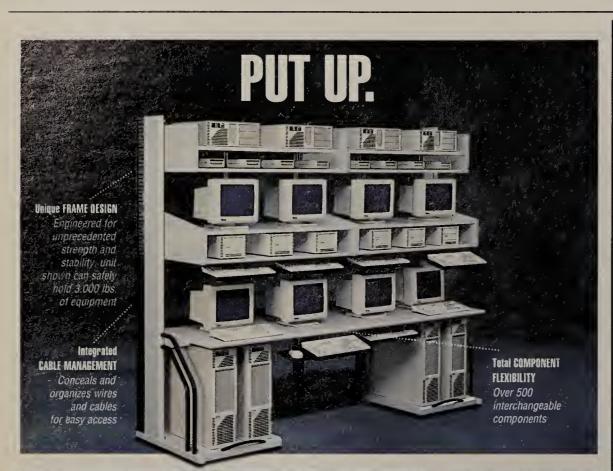
Tip of the week

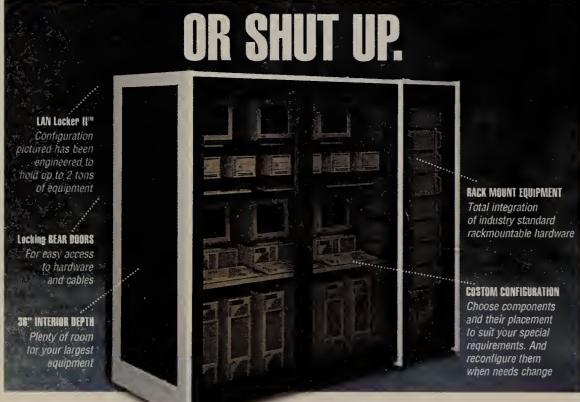
If you are using Microsoft Corp.'s Internet Explorer Web browser, there are a lot of ActiveX controls available. If you're not willing to buy Microsoft's Explorer Starter Kit to get the ActiveX controls, a visit to www.activex.com (not affiliated with Microsoft) will let you download the most extensive collection available on the 'Net.

released a spec for Java's component architecture. Called JavaBeans, it firmly supports both DCOM and CORBA. This is significant because before this, Sun was firmly ensconced in the CORBA camp.

Going even further, Netscape has announced its intention to "embrace" Microsoft products and technologies. Some may argue that Netscape is simply bowing to the realities of the marketplace, but to me, it looks like Netscape is trying to stem the rush to Internet Explorer by "co-opting the center."

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.





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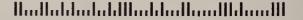


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■ Several companies will announce conferencing products this week at the Telecon XVI trade show in Anaheim, Calif.

RadVision, Inc. will roll out the L2W-323, a gateway for connecting LAN-based H.323 video terminals to H.320-compliant terminals over ISDN or other switched digital nets. H.323 is a new standard for videoconferencing over IP networks. The L2W-323 is a stand-alone unit that connects up to four calls between IPbased coder/decoders. Available in the first quarter of next year, the product's pricing starts at \$5,950.

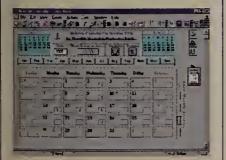
Separately, VCON, Inc. will announce the Armada Cruiser 150 System, an upgrade to its desktop videoconferencing system that now supports up to 26 frames per second across a variety of LAN and WAN links. Previously, the system supported 22 frames per second. Available next month, the system runs on Windows 95; it may be upgraded to Windows NT next year. Pricing is \$1,895 per desktop.

RadVision: (201) 529-4300; VCON: (214) 735-9001.

■ IntellAgent Control Corp., based in Dallas, this month will ship an upgrade of its sales force automation software for Lotus

Development Corp.'s Notes.

The upgrade supports Notes Release 4 and has enhanced workflow capabilities. Another new feature, the IntellAgent Group Scheduler, may be used to priori-



tize tasks and view reports about sales performance. The application is priced at \$9,995 per server and \$495 per client.

IntellAgent Control: (214) 776-

LinkAge smooths E-mail migration

Exchange message switch provides connectivity to other mail systems and directories.

By Barb Cole

LinkAge Software, Inc. this week will announce software for companies that are migrating to Microsoft Corp. Exchange from multiple E-mail systems.

LinkAge Message Exchange (LME) is a message switch that links Exchange to other mail systems, such as Microsoft Mail and Lotus Development Corp.'s

LME is expected to improve Exchange's ability to function as a backbone across an enterprise by providing hooks to mail systems and directory-sharing capabilities that are not currently available in Microsoft's client/ server messaging system.

Supplemental messaging backbone technology for Exchange is currently available from several vendors, including Notes, cc:Mail, Systems Network Architecture Distribution Services and OfficeVision — are configured and managed using the Exchange Administration interface.

The software also relies on the Microsoft Exchange Internet Mail Connector and X.400 Message Transfer Agent for connections to the Internet and X.400 systems. As a result, companies can use LME to consolidate Internet access across multiple mail systems at a single point.

In addition, LME uses SNA Server in Microsoft BackOffice to connect to mainframe-based mail systems, and may be deployed using Microsoft's Systems Management Server.

While LME may be used for migrations, users said the software will also come in handy for linking disparate mail systems over the long term.

"You make quite an investment in these mail systems, and you don't want to throw them away," said Duncan Vickers, vice

president of information technology and chief information officer at Telus Corp., a telecommunications company Edmonton, Alberta. Telus is using LME to connect its three mail systems: Exchange, Notes and a Simple Mail Transfer Pro-

Read one consultant's detailed analysis of why Notes is better than Exchange for enterprise messaging.

Enter the number to the right in the DocFinder box on the home page.



NetworkWorld

tocol-based system.

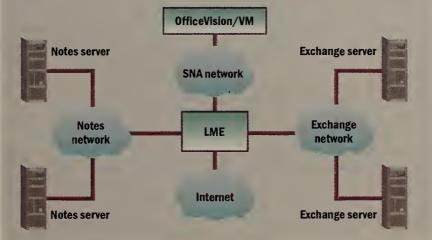
According to Vickers, the main value of LME is its ability to share directory information between the systems. "It's really not that big a deal to move a message from A to B, but the ability to have a unified directory across the company is great," he said.

Available now, LME runs on Windows NT servers. Pricing starts at \$14,000.

OLinkAge: (613) 594-9244.

FINDING THE MISSING LINKAGE

LinkAge Message Exchange (LME) may be used to consolidate Internet access for Lotus Notes, Microsoft Exchange and IBM Professional Office System (PROFS) users across an enterprise.



Notes and cc:Mail, as well as IBM OfficeVision and other hostbased systems.

The software allows users to send and receive mail across disparate systems and to share directory information.

IBM's SoftSwitch division, Worldtalk Corp. and Control Data Systems, Inc. However, LME is unique in that it is tightly integrated with Exchange and Windows NT.

LME's four connectors — for

Iona executive gives object lesson

Microsoft Corp., Netscape Communications Corp. and Sun Microsystems, Inc. start talking

fighting over objects, and the next thing you know, everyone is clamoring about object request brokers (ORB). Chris Horn, president of Iona Technologies, Inc. in Dublin, Ireland, recently spoke with IDG News Service's London bureau correspondent Niall McKay about com-

peting in the suddenly booming your Orbix ORB? distributed object market.

How did you realize that what the world really needed was an ORB?

While we were working on the ESPRIT [European Strategic Program in Information Technology] program at Trinity, we started attending all the Object Management Group meetings

and got to meet all the key object players. We then realized that object technology was going to

become very important by the mid-'90s. So we decided that what was needed was an ORB. That was a shrinkwrapped software package that would run on top of either Unix or Windows.



Your first big break was when Sun took an equity stake in you and

Yes. In 1993, Sun offered us a development deal to integrate Orbix with Sun's ORB, now Network Enterprise Objects (NEO). So we said to Sun, 'Why not take an equity stake in us instead of paying us a contract fee?'

Then last year, we landed another big project. This time, it See Horn, page 32

Sybase to bring Web sites to life

By Ed Golden

Emeryville, Calif.

Sybase, Inc. has unveiled a strategy to let customers move away from Web sites with static content to create databasedriven sites.

Based on Sybase's strategy, a Web site would have a single, personalized, integrated Internet content management system that would be updated automatically and viewable offline.

The cornerstone of the plan is a new version of the Sybase database — dubbed Sybase SQL Server Professional — which was introduced at the International

Sybase User Group Conference in Barcelona, Spain. SQL Server Professional is geared toward database administrators and users who operate small Web sites or intranets for their businesses, said Terry Stepien, vice president of Sybase's workplace database division.

SQL Server Professional will include NetImpact Dynamo, which will work with Sybase SQL Server 11 to provide unified management of database and Internet information assets, while storing all Web content in the database.

See Sybase, page 32

SHARED LOGIC

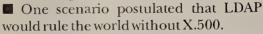
What LDAP means for X.500

s the Lightweight Directory Access Protocol (LDAP) the salvation of X.500 or its death sentence?

This was the subject of a heated debate at a recent Electronic Messaging Association (EMA) conference in Santa Clara,

Calif., where two of the three LDAP authors/inventors participated in a panel discussion reviewing X.500 and LDAP.

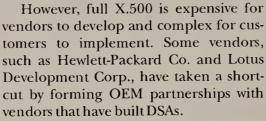
Tim Howes, a key LDAP contributor while at the University of Michigan at Ann Arbor and now a Netscape Communications Corp. engineer, presented two scenarios concerning LDAP and X.500:



■ The other was that LDAP would make X.500 more accessible, and together they would rule the world.

The issue is, while LDAP is based on X.500, it technically only addresses the client/server access protocol. It doesn't solve all the back-end directory issues associated with administration, distribution, replication and coexistence. These issues were intended to be solved by X.500 Directory System Agents (DSA) through support for full X.500 server-to-server directory protocols.

> A number of vendors have developed X.500 products, there is an X.500-based Internet White Pages, and X.500 is employed internally by some companies. Given that one of the key factors inhibiting X.500's success has been a lack of desktop users, LDAP should give X.500 a huge shot in the arm.



So the question arises: Once LDAP is widely available, what will users be running on the back end? Personally, I'd like to frame the issue using more shades of gray than Howes' simple dichotomy pre-

I see the industry moving toward four possible scenarios:

■ X.500 is supported by all vendors and takes over at the back end.

Proprietary solutions, such as Novell, Inc.'s Directory Services, Lotus Notes' Name and Address Book or the planned Microsoft Corp. OLE Directory Service, remain frozen forever in a cold war of uneasy coexistence and competition.

■ Multivendor directory servers use LDAP to talk to each other.

■ Mixed directory server environments involving all of the above proliferate.

The X.500 standard should continue to grow in use because it provides powerful tools that are useful in complex directory environments. There will also be a market for LDAP servers providing distributed functionality in simpler environ-

The market is diverse enough to accommodate a range of solutions.

Blum is a principal at Rapport Communication, a consultancy that focuses on messaging, groupware and electronic commerce. He can be reached at dblum@interramp.com.



Daniel Blum

Advertisement

Understanding ATM Traffic Management Specifications



By Fraser Street

The Traffic Management Specification version 4.0 (TM 4.0) is one of the ATM Forum's foundation specifications. It defines the ATM layer support required by higher layer ATM Forum service spec-

ifications such as LAN Emulation 1.0 and Audio/Visual Multimedia Services 1.0.

TM 4.0 specifies an updated traffic management service architecture. This new architecture refines three well-known service categories: Constant Bit Rate (CBR), non-real-time Variable Bit Rate (nrt-VBR), and Unspecified Bit Rate (UBR).

It also introduces two new service categories: real-time

Variable Bit Rate (rt-VBR) and Available Bit Rate (ABR). The specification of ABR, which features a closed loop flow control mechanism based on feedback from the network, is one of the most significant contributions of TM 4.0.

Each service category provides a distinct Quality of Service (QoS) to its connections. Together, these categories meet the QoS requirements of a broad range of ATM network applications. For example, a delay-insensitive data application that uses a reliable transport protocol like TCP would find the quality of service afforded The ATM Experts™

by the UBR or ABR categories to be most appropriate. But a delay-sensitive multimedia application would likely require the provisioned bandwidth and delay objectives of rt-VBR.

TM 4.0 specifies a set of performance objectives that define the QoS provided by each of the five service categories, as well as a set of mechanisms used by network equipment to ensure that the performance objectives of each individual connection are satisfied.

The QoS performance objectives defined in TM 4.0 include the cell transfer delay (latency), cell delay variation (jitter), and cell loss ratio. In addition, the UNI Signalling 4.0 specification enhances QoS QoS objectives for each

connection are satisfied through the following mechanisms: traffic policing, call admission control, various forms of intentional packet and cell discard, and in the case of the ABR category, sophisticated flow control.

As ATM equipment implementing TM 4.0 becomes available, users will quickly

realize the unique benefits of QoS. Networks that conform to TM 4.0 will support integrated services (i.e. data, voice and video on a single network) by meeting the QoS requirements of each of these

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Videoconferencing: Coming to a TV near you

By Kristi Essick

Danvers, Mass.

PictureTel Corp. last week unveiled an ISDN-based videoconferencing system called SwiftSite that works with a regular television.

The system, a 10-pound settop box, will sell for \$8,995. It includes a camera with pan, zoom and tilt functions, a microphone, an ISDN telephone line connection and audio/video compression components,

according to PictureTel.

Video delivery over the system averages about 15 frames per second. Also



PictureTel's SwiftSite, a portable ISDN-based videoconferencing system, can be used with a regular television.

included with SwiftSite is an infrared remote control device.

The portable system is H.320-compliant and will work with conference room and desktop systems that are standards compliant.

PictureTel has already sold 1,000 SwiftSite devices to test customers, and is lining up partners to distribute, co-brand and license the

Essick is a correspondent with IDG News Service's San Francisco bureau.

Sybase

Continued from page 31

"Most of what you find on Web sites today is static content," Stepien said. "There is some marketing literature, some graphics and some sound, but you won't find much transactional informa-

"What we're heading toward is an envi-

ronment where business applications are being delivered via the Internet, and are appearing in browsers," he added. "The difference you need there is dynamic content. You want information to be connected to the database where business information is located."

Because the Web site and the data are stored in the database, the technology is available to have the Web site running at different locations and replicated, Stepien said.

IT'S A SNAP

Among the vendors building snap-in modules to manage advanced database content within Sybase SQL Server are:

- Fame Information Services
- Network Imaging
- Verity
- Vision International

Sybase's move to manage Web information had been expected, said Chris LeTocq, an analyst with Dataquest, Inc.

"It'll be interesting to see if Sybase can transfer its expertise into the online transfer area, where a wider solution knowledge is required for actively managing Web information," LeTocq said. "This is a potential gold mine for database companies. It's about time they started digging.'

Golden is a correspondent with IDG News Service's Boston bureau.

Horn

Continued from page 31

was Boeing. They wanted to network 40,000 PCs and workstations and 25 mainframes. So they used Orbix to enable the various applications to talk to each other over the network.

So what is next?

The first thing we need to do is expand our marketing operation. We just got a bigger office in Boston, and we will be taking on more marketing people there.

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What sort of technology do you plan to

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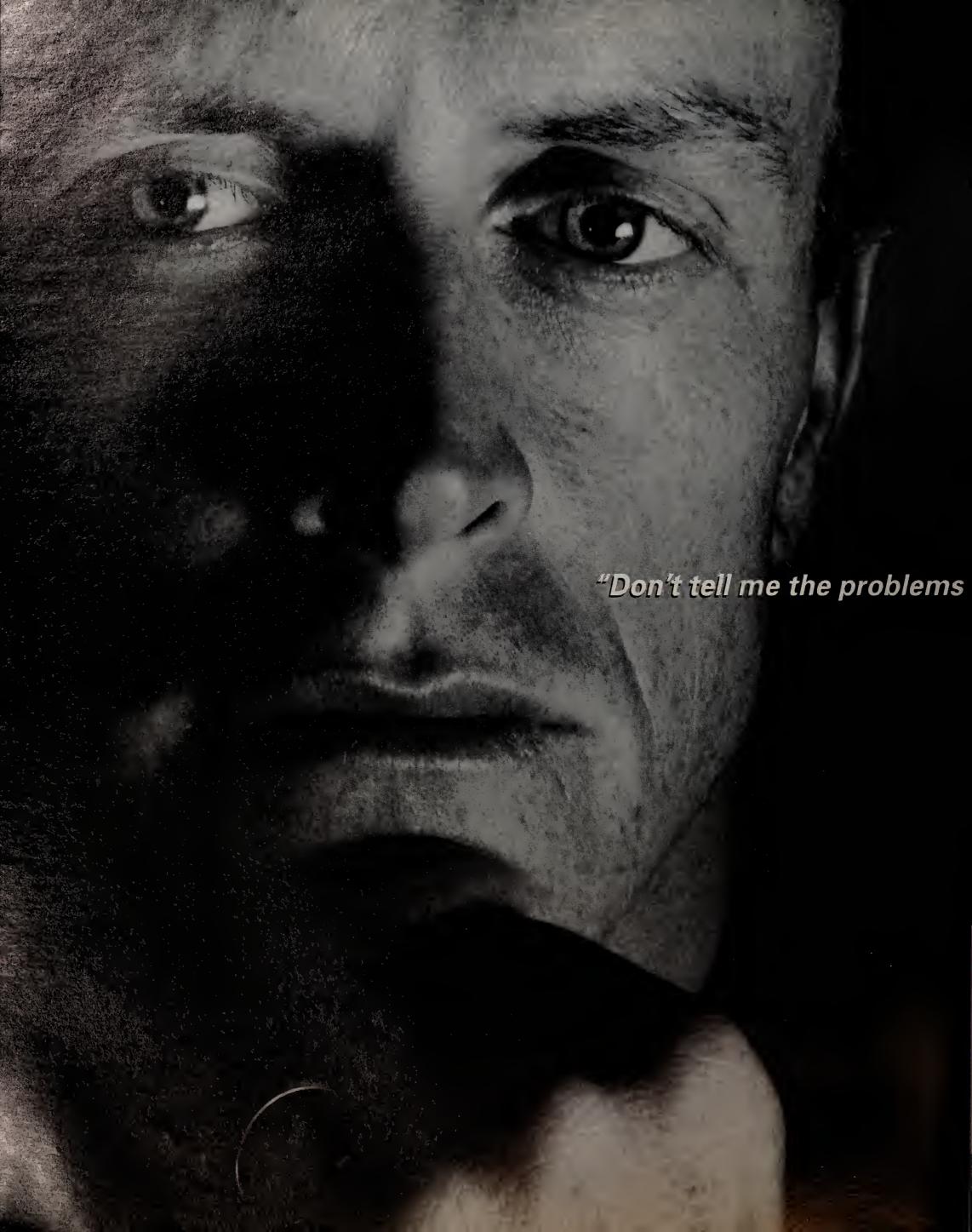
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Briefs

■ HDS Network Systems, Inc. has released an upgrade to its Network Computer oper-



ating system. According to HDS Executive Vice President Michael Kantrowitz, HDS netOS.2 has a PCstyle interface and supports the

ability to run Windows applications over the Internet through Citrix Systems, Inc.'s Intelligent Console Architecture interface. HDS: (610) 277-8300.

■ The U.S. Postal Service

has selected Cylink Corp. to design, test and build the Postal Electronic Commerce System (ECS). Expected to be operational next year, the Postal ECS will perform electronic postmarking at roughly one-third the cost of today's first-class postage rates, according to Postal Service authorities.

■ Stingray Software, Inc. has started shipping a Java class library called Objective Blend 1.0 for Java, which contains more than 10 graphical Java classes to extend Sun Microsystems, Inc.'s Abstract Windowing Library. Objective Blend costs

Stringray: (800) 924-4223.

■ The user/vendor group Open **Users Recommended Solu**tions (OURS) has issued guidelines to help organizations apply a wide range of security technologies to intranets, the Internet, value-added networks and voice networks. A 15-page executive summary is available for free at www.ours.org, or the complete documents can be ordered for \$49.95 via the Web site or by calling (312) 527-6782.

■ In a recent survey of 1,342 security professionals, conducted by Delran, N.J.-based research firm Datapro Information Services Group, only 54% of the survey's respondents said their companies have a security policy in place.

Mass 'Net advertising is not cool

By Joanie Wexler

San Jose, Calif.

Just how much can you rely on the Internet for conducting business promotions?

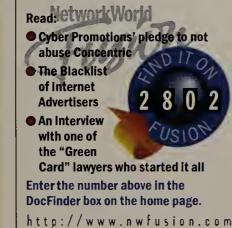
That is one big question that was at least partially answered by a U.S. District Court decision

here recently that limits one organization's practice of "spamming" - or sending piles of unsolicited promotional junk mail to unsuspecting 'Net

In what is thought to be the first court ruling that puts specific limits on 'Net behavior, online marketing firm Concentric President Cyber Promotions, Inc. Hank Nothhaft. in Philadelphia was

told to quit flooding user mailboxes with electronic advertisements.

Cyber Promotions' activity has been curtailed, at least where it affects users connected to the network of Concentric Network Corp., a Cupertino, Calif.-based Internet service provider.



The legal dispute was touched off by a Labor Day weekend spamming spree by Cyber Promotions that backed up Concentric's mail servers for 18 hours. The decision, however, was based on a technicality. While Concentric markets unlimited dial-up services for \$19.95, their terms specifically prohibit any customer from sending more than 50 broadcast messages to individuals or to 15 newsgroups in a single day, said David Kramer, an attorney at Wilson, Sonsini, Goodrich & Rosati, Concentric's Palo Alto, Calif.- based legal counsel.

Cyber Promotions President Sanford Wallace was ordered to swear, under penalty of perjury, that the company would cease the activity.

Concentric is seeking compensatory damages and punitive

damages, as well. At issue is the fact that mail was sent by Cyber Promotions from a Concentric domain cyberprom3@cris.com — which led recipients to believe that Concentric condones spamming and damaged the firm's credibility, said Concentric President Hank Nothhaft.

Concentric alleged that Cyber Promotions

spoofed its source E-mail address to appear to be on the Concentric net.

Wallace denies spoofing his address. Rather, he pointed to a recent spat with America Online, Inc. — which also tried to get a restraining order against the company's spamming practices as the origin of the problem. AOL was told by a district court in Philadelphia last month that it could not prohibit Cyber Promotions from sending E-mail to its five million subscribers, but it could take steps to block

the messages. AOL then issued filters to its members who did not wish to be spamming targets.

Also at issue for Concentric was that the unexpected flood of traffic resulted in piles of undelivered E-mail returned to Concentric servers, clogging its network and chewing up its server capacity. Nothhaft said many of the nearly one million messages sent by Cyber Promotions spilled over into 'Net backbones run by Netcom On-Line Communications and PSINet, Inc., choking network exchange points.

SPAMMING DEFINED

What is it? Converting a Usenet newsgroup or other accessible LISTSERV list to a program that will mail the same message to all members of every group.

What is all the fuss? Some consider the Internet to be a low-cost, legitimate way to conduct promotions, akin to direct mailing via the U.S. Postal Service. But many Usenet and LISTSERV charters specifically prohibit offers to do business. The flooding of thousands of machines with messages can cost Internet service providers or others hundreds or thousands of dollars in network capacity and server processing time.

> On the one hand, direct-mail marketing is a business tool for many firms, and some believe that an electronic version of the practice has a place on the 'Net. But it can cost recipients who pay for 'Net access based on the length of time they are connected.

> "This would be like a telemarketer calling you on your cell phone — you pay for the call," Kramer said.

> Wexler is a former Network World Senior Editor.

Check Point adds fuel to firewall

By Ellen Messmer

Mail was sent by Cyber-

centric domain, said

Promotions from a Con-

Redwood City, Calif.

Byyear-end, Check Point Software Technologies, Inc. plans to ship a new version of its Firewall-1 product to handle IP load balancing and content screening.

Whether protecting a Web site or a File Transfer Protocol server, Firewall-1 Version 3.0 will run what Check Point calls a Connection Control module that can direct data traffic with a single logical IP address to a farm of duplicate servers to perform load balancing.

"It can handle load balancing of Internet traffic, but in an intranet application for a big company, this could be an issue, too," said Deborah Triant, Check Point president and chief executive officer.

For companies with multiple 'Net connections, Firewall-1 could create a system of backup firewalls for redundancy since they can share state tables.

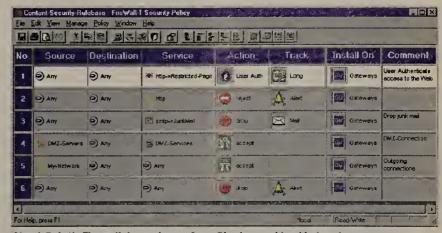
Firewall-1 Connection Control — which Check Point com-

pared to similar controls in Cisco Systems, Inc. routers — is the latest step in the evolution of the firewall from simple sentry to busybody handyman.

Check Point will be adding a

seem to come from the 'Net," said Boston Edison Co. engineer Harry Markoupolos, adding that Firewall-1 seems to be taking a flexible approach to antivirus protection.

Firewall 3.0 will also let network managers monitor user access to specific URLs.



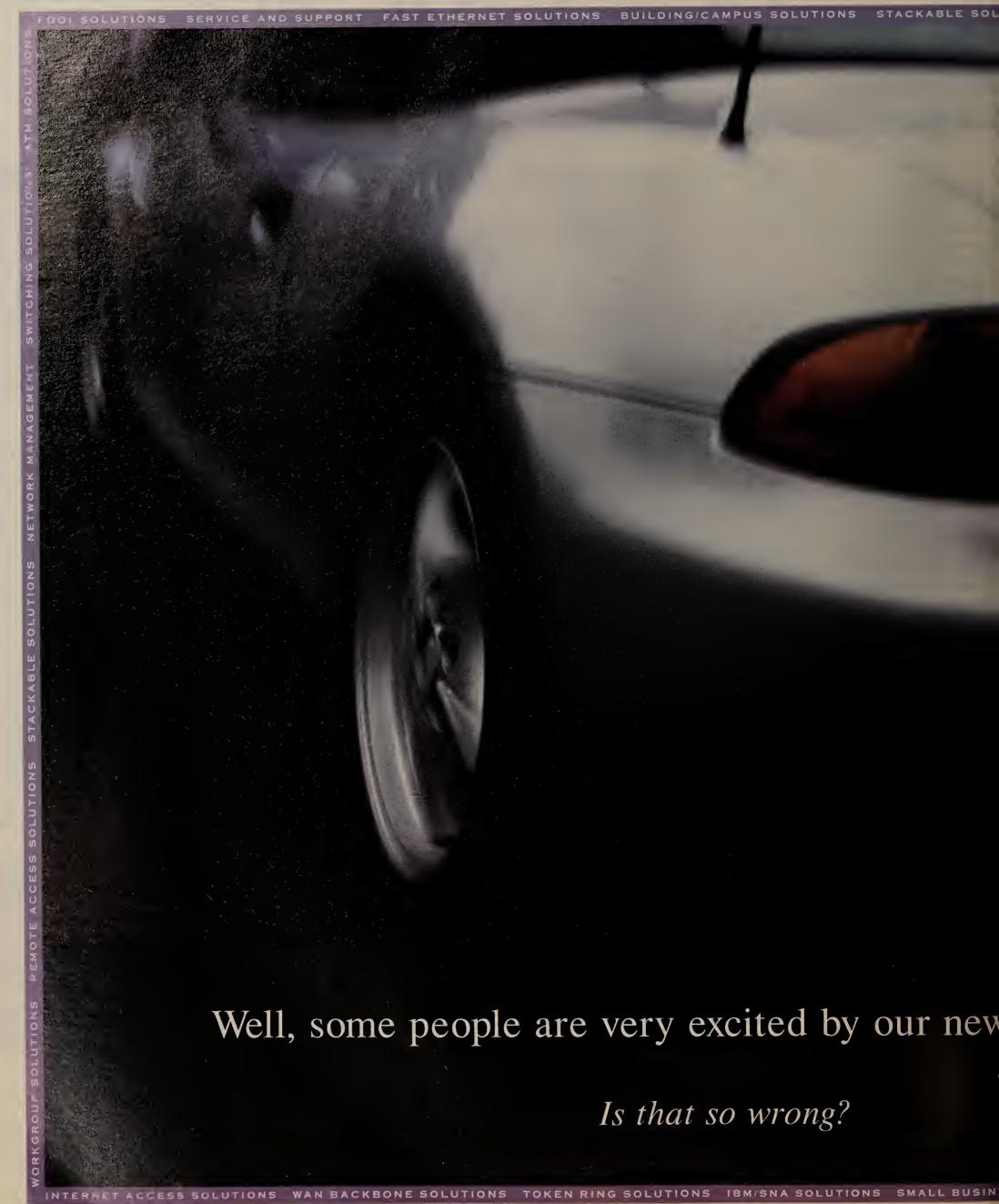
Check Point's Firewall-1 now boasts Java filtering and load balancing.

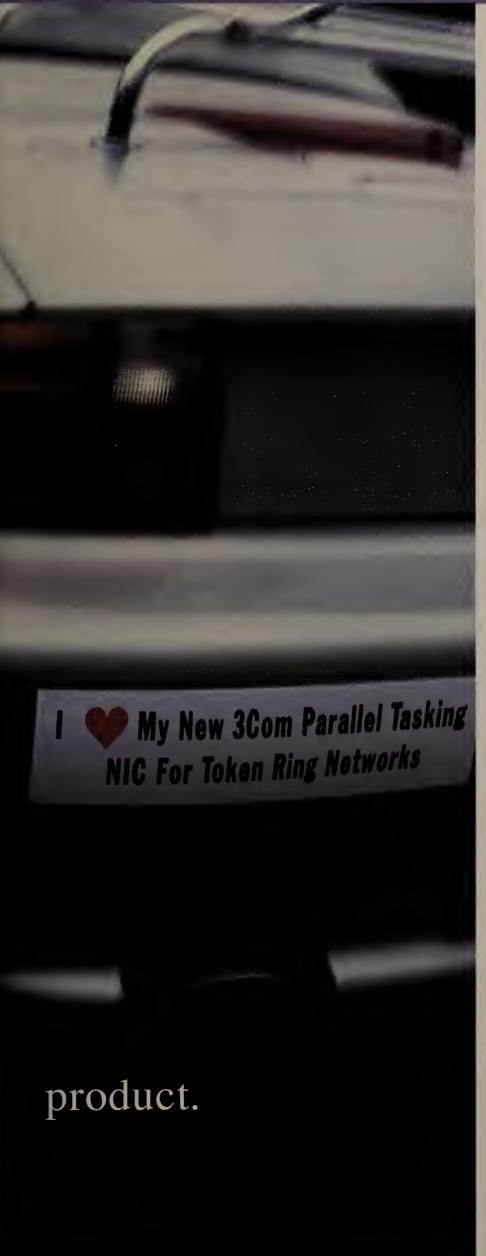
content-security mechanism that will let the firewall work with a full-text search engine or antivirus program to stop unwanted or harmful content from entering the intranet.

"We're constantly finding viruses here, and most of them

Firewall-1 3.0, which has not yet been priced, will support IP security encryption, the Radius authentication protocol and the AssureNet authentication

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NETWORKS THAT GO THE DISTANCE

'NET INSIDER

Why can't an ISP be more like a phone company?

here has been a growth industry in second-guessing following the multihour outage of BBN Planet's point of presence at Stanford University on Oct.

http://www.gsnetworks.com

11. The basic theme of the Monday-morning quarterbacks is BBN had not been as paranoid as a phone company would have been in protecting its POP from the possi-

bilities of power outages.

I expect this is true. A phone company I dealt with a couple of years ago needed to replace the main power transformer for

one of its central offices (CO). This CO had its own set of batteries capable of running the telephone switch for many hours, and its own turbine generator capable of supporting the whole building with enough fuel to run it for days.

The phone company also brought in a second, similar-size turbine generator on a trailer truck, which was still not safe enough. So the company brought in another truck-mounted generator big enough to run the switch itself. This paranoia costs real money. Money is quite easy to get when you are a regulated monopoly — actually, in some cases, because allowable tariffs are based on costs plus a percentage of profit, the higher the justifiable costs, the higher the profit.

While I can't resist saying that it might have been a good idea to have a portable generator lying around to be transported

to a problem site, it is a bit hard to understand in the abstract just what type of backup is worthwhile. BBN said there was a triply redundant



power feed to Scott Bradner the site, and

there is a long history of very reliable power. Note that this same site houses Stanford's PBX, and I expect that Stanford's own phone people tend to be a bit paranoid when it comes to reliability.

Security 101 says a risk analysis should be done before deciding what type of security you need in a situation. It generally is not worth putting in a security system valued at substantially more than the thing you are protecting. In this case, one would have to take into account the failure probability and the cost of that failure. At least BBN now has a better understanding of what the cost of failure is, to both the company and its customers.

In the future, Internet service providers must do an increasingly better job of providing a reliable infrastructure to support the requirements of commerce. But, even with higher requirements, many customers will opt for low cost over reliability and quality. I would expect many ISPs to slant their risk analysis a bit more to the paranoid side as a result of this incident.

An interesting thing to note is that the new services the phone companies are now offering do not lend themselves to ultrareliability. With good-old analog telephone service, you can pick up your phone during a widespread power failure and hear a dial tone. With ISDN you have to supply local power to the phone set. If your power is out, it does not help that the phone CO is glowing in the general dark.

Disclaimer: Harvard has lots of ISDN phones (for voice, not data), but the emergency phones in the elevators are analog—so I can call in my personal opinions while sitting in the literal dark.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached at sob@harvard.edu.



Circle Reader Service #23

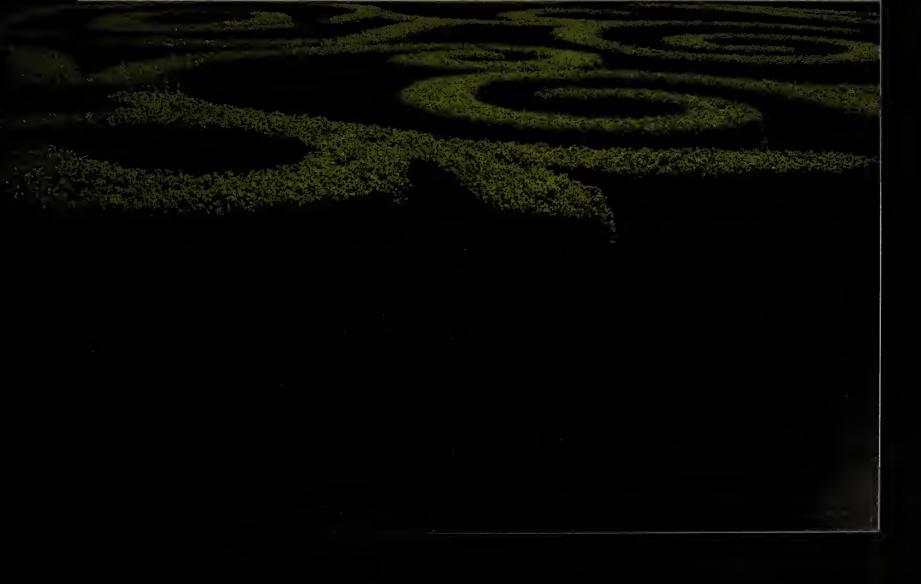
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distributed

about open while Combelieve tha

These days, you hear a lot of companies talk about open system computing philosophies, and while Compaq was one of the early pioneers, we believe that it's time to take a big step farther.

a c c e s s To an open business philosophy. A philosophy that begins with something we call Distributed Access.

Distributed Access is not a canned solution. It's not a new piece of hardware or software or a sales force. It's an idea literally based in decentralized network computing environments and figuratively

ACCESS. THE DIFFERENCE BETWEEN AN

based in distributing *access* to the people who need it. It's a new model of computing that offers the control of traditional legacy systems and the added flexibility and freedom to help you connect people to people and people to information.

How can we do that? By taking the time to understand not just your computing needs today, but the direction of your entire company. Knowing where you want to go and how you want to get there. But most of all, by knowing that what's truly important isn't computers or computing, it's information.

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UST THE PARTNERSHIPS TO FIND

distributed



Can one company make an idea like Distributed Access a reality? Yes, if that company doesn't think like one company.

a c c e s s If that company jettisons the one-stop-shopping, "we can do it all" mentality. If that one company keeps an open mind.

In the world of Distributed Access, an open mind is one that is ready and willing to embrace better ideas, no matter where they come from.

At Compaq, we work with Microsoft, Novell, SAP, EDS, Oracle and Intel every day, day in and day out, to make sure that you not only get best-of-breed solutions, but the right best-of-breed solutions. Solutions like that don't happen by phone or fax or by getting together in Las Vegas for a few days. They happen when people roll up their sleeves and work together.

Which is why we have engineers that actually live in Redmond, Washington, constantly testing and improving the performance of Compaq servers running Windows NT.* Microsoft, on the other hand, tests products like Microsoft Exchange Server* and Microsoft SQL Server* using Compaq servers as their lab.

Our Integration Management solution allows you to integrate Insight Manager with the likes of BMC, Cabletron and Seagate.

Compaq's partnerships with the brightest people in the technology world mean that we see new ideas sooner and, as you might expect, we're able to incorporate them into your business sooner.

The same goes for potential problems. We'll be the first to know and the first to fix the problem. Which means you'll be the last to get burned.

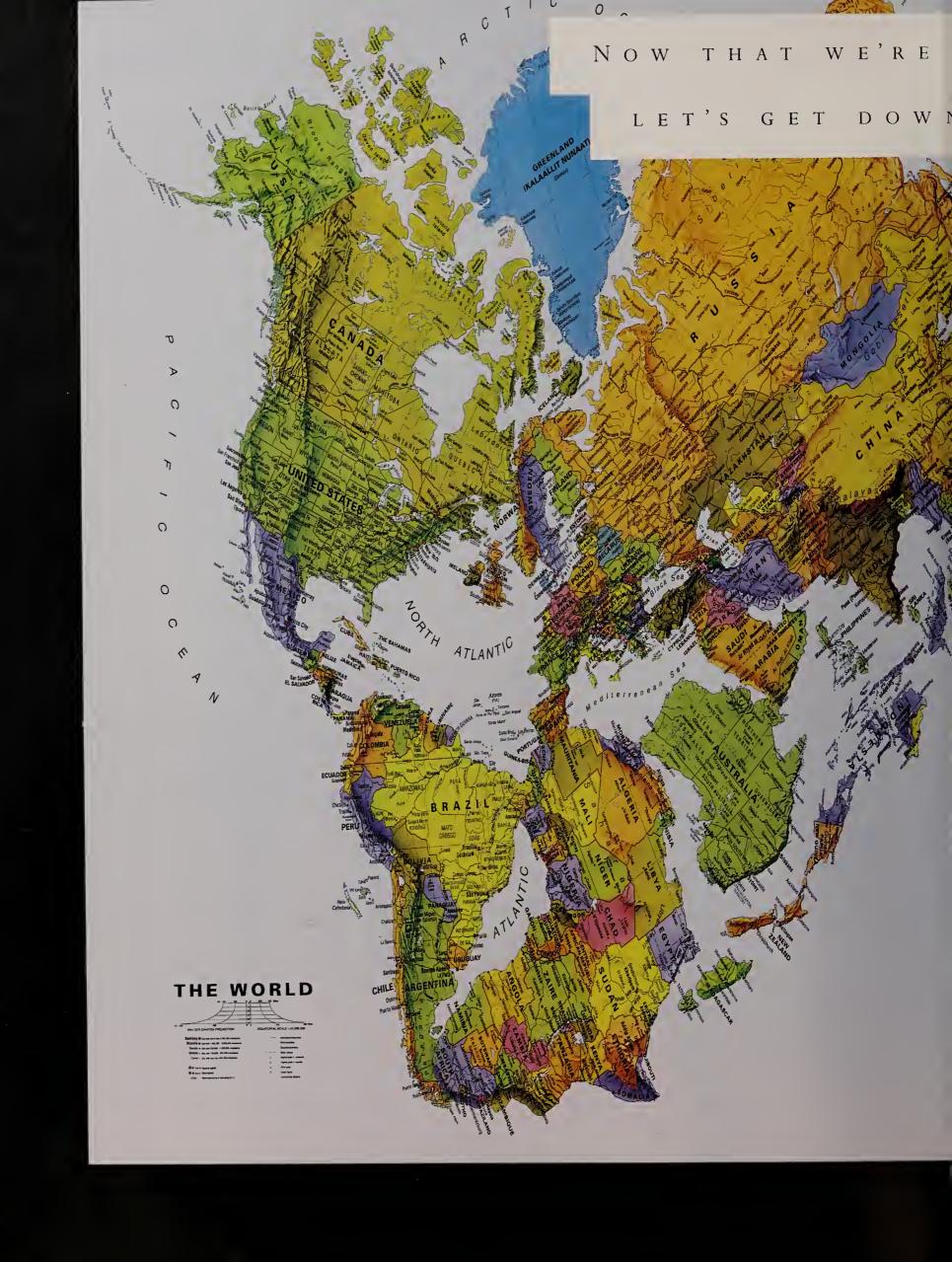
To put it bluntly, when it comes to Distributed Access, partnerships are not considered smart public relations. They are considered the cornerstone of the way we do business.

They keep us one (maybe two) steps ahead of our competition.

And we believe they can do the same for you.

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Whether they be the plaster partitions of offices, the geographic boundaries of countries or the invisible barriers of time zones, the walls of business are about to come tumbling down thanks to two phenomena known as the Internet and the Intranet.

Through Distributed Access, we intend to not simply help this happen, but to make it happen.

The fact is, Compaq's philosophy—the ongoing establishment of industry standards and development partnerships—perfectly mirrors the foundation upon which the Internet has been based.

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The way we see it, the Internet is not just about reaching out, it's about reaching in. Which is why we've entered into partnerships with the likes of Microsoft, Cisco, BMC Software and Intel to establish Web-based enterprise management tools.

Soon, you will be able to manage complex networks

using any Web browser. In other words, reducing both the complexity and cost of systems management by using Internet technologies to solve old problems in new and better ways.

Over the years, a lot of people have talked about the coming of the information superhighway. The fact of the matter is, it's not coming, it's here. It's called the Internet.

Distributed Access can make sure you and your business are drivers, not just passengers.

COMPAQ

Has It Changed Your Life Yet?

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Has It Changed Your Life Yet?

Technology Update

Keeping Up with Network Technologies and Standards

NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I'd like to expand the 160M-byte SYS volume of a NetWare 4.1 server. Is it possible to copy or move the contents of my current SYS volume to a bigger volume on another disk? If so, how?

Fred Katsuml, Chugal Boyekl (America) Corp., New York

You can copy the files from your current volume to a new SYS volume, which temporarily will have to have a different name, such as SYS—NEW. Before starting the process, however, run Bindfix twice. You want to create a backup set of bindery files that can be restored after the files have been copied to the new volume.

After copying the files, load the Install NetWare Loadable Module, dismount the volumes, rename SYS to SYS—OLD and SYS—NEW to SYS and then remount the volumes. For the new SYS volume, you'll need to run Bindrest, from the system directory, to restore user login 1Ds, group names and passwords. (The bindery files are not copied because they are kept open when the server is operational.)

To ensure the highest level of success, unload all possible modules — except for the hard disk controller and LAN card drives — before copying files from the source to the target volume. You want the minimum number of files open to reduce the possibility of a problem during the process.

Having outlined that option, a better and, in my opinion, safer solution is copying the files from one drive to a backup server. Then you change which drives are mounted and restore the tape to the new volume.

I'd recommend spanning the current SYS volume to a new drive only if the drive pair making up the new SYS volume is backed by a mirrored set of drives.

And, I'd span drives to increase space on SYS only as a temporary measure and if no other options are available. A spanned volume is only as stable as the weakest (probably the oldest) drive in the spanned volume set.

Best of both worlds: the Internet-enabled call center

By John Ryan

As the Internet phenomenon grows, merchandisers are following mainstream consumers onto the World-Wide Web. In 1995, the 100,000 retailers on the Web rang up a respectable \$324 million in sales, according to Jupiter Communications, a market research firm in New York. Experts predict that number will grow to almost \$2.8 billion in the year 2000, when one-third of U.S. households will be connected to the Web.

With the burgeoning electronic commerce on the Internet, the traditional call center will experience revolutionary change. As more consumers browse and buy online, corporate call center operations must adapt to a new stream of customer transactions that originate in cyberspace.

Consequently, enterprise call centers are looking for a single, cost-effective solution that offers an integrated point of contact for online and telephone communications, while also delivering convenient, quick and high-quality service no matter where the transaction originates. Enter the Internet-enabled call center.

To be effective, the Internetenabled call center will be media-independent, taking advantage of new technologies and providing improved methods for handling customer transactions. For maximum flexibility, this type of call center will utilize open systems- and industry standard-based products such as Microsoft Corp.'s Telephony Applications Program Interface (TAPI), Netscape Communication Corp.'s Navigator browser and Sun Microsystems, Inc.'s Java programming language.

Finally, Internet-enabled call centers will leverage the enterprise's investment in call center technology by building on existing platforms and applications, including automatic call distribution, interactive voice response (IVR) and computer-telephone integration (CTI).

Mass merchandisers are em-

bracing the Internet today to take advantage of lucrative opportunities as Web-based commerce becomes mainstream. However, no one expects the customer voice call to go away; it may change a bit, though.

Callback scenario

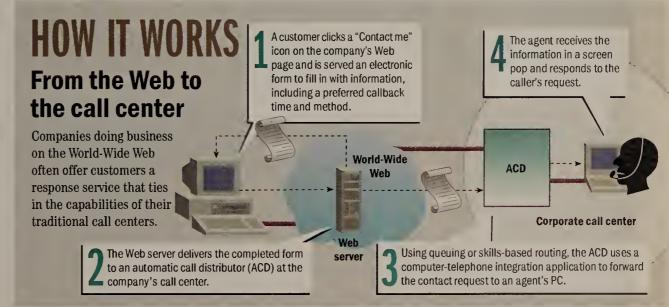
One of the most common choices offered on Internet commerce sites is a "Contact me" icon, which visitors can use to request a company representative contact them. This callback this information, the agent is better prepared to respond to the caller's request.

This process can be automated even further when an IVR system is used to make the callback. The transaction might be completed through the IVR's voice prompts and the customer's telephone keypad response. More advanced systems provide automated speech recognition, which allows customers to speak rather than key in their choices. Of course, the customer could

tomer service will have a decided advantage in this upscale market. Armed with superior customer data, agents will be better prepared to provide the best possible service, with opportunities to upsell or cross-sell other products.

Companies that understand and promote the Web-telephony convergence also will benefit by increased call center productivity. As these media converge, simple transactions will be automated and migrate toward the 'Net, while the live transactions will become more complex.

The Web is bringing about a revolution in buying habits. But for most businesses, the Internetenabled call center will be realized through evolution, not



function, implemented through open systems interfaces, is the critical first point where the Internet and traditional call centers are converging.

When a cyberspace shopper clicks on the "Contact me" icon, it links to a Web page containing an electronic form. Customers typically are asked to fill in their name, shipping address, phone number and preferred callback method such as E-mail or fax. This data is automatically transmitted from the Web server to the company's call center, where a server-based CTI application routes it to the appropriate agent for follow-through. The agent selection may be based on simple queuing or skills-based routing.

The callback request arrives along with the customer information via a "screen pop" on the agent's PC running TAPI-compliant middleware. Armed with

choose to be transferred to an agent at any point, in which case the information gathered through the IVR would be added to the original CTI screen pop.

The response to a callback request is not necessarily a voice call. The call center can also be configured to reply to the customer via E-mail, fax-back services or newsgroup postings.

Ultimately, calls will be carried as packets over the Internet and circuit-switched calls over the telephone network.

Benefits of convergence

The Internet-enabled call center offers many advantages. First, it offers faster, more convenient service for cyberspace customers.

This rapidly growing segment of the population represents a desirable demographic, and retailers providing the best cusrevolution.

The traditional call center values — customer service, agent productivity and cost control — will remain the primary factors, even in cyberspace.

Ryan is vice president and general manager of multimedia business applications/Internet solutions for Northern Telecom, Inc. in Richardson, Texas. He can be reached by calling (972) 684-5999 or via E-mail at 0233219@nt.com.

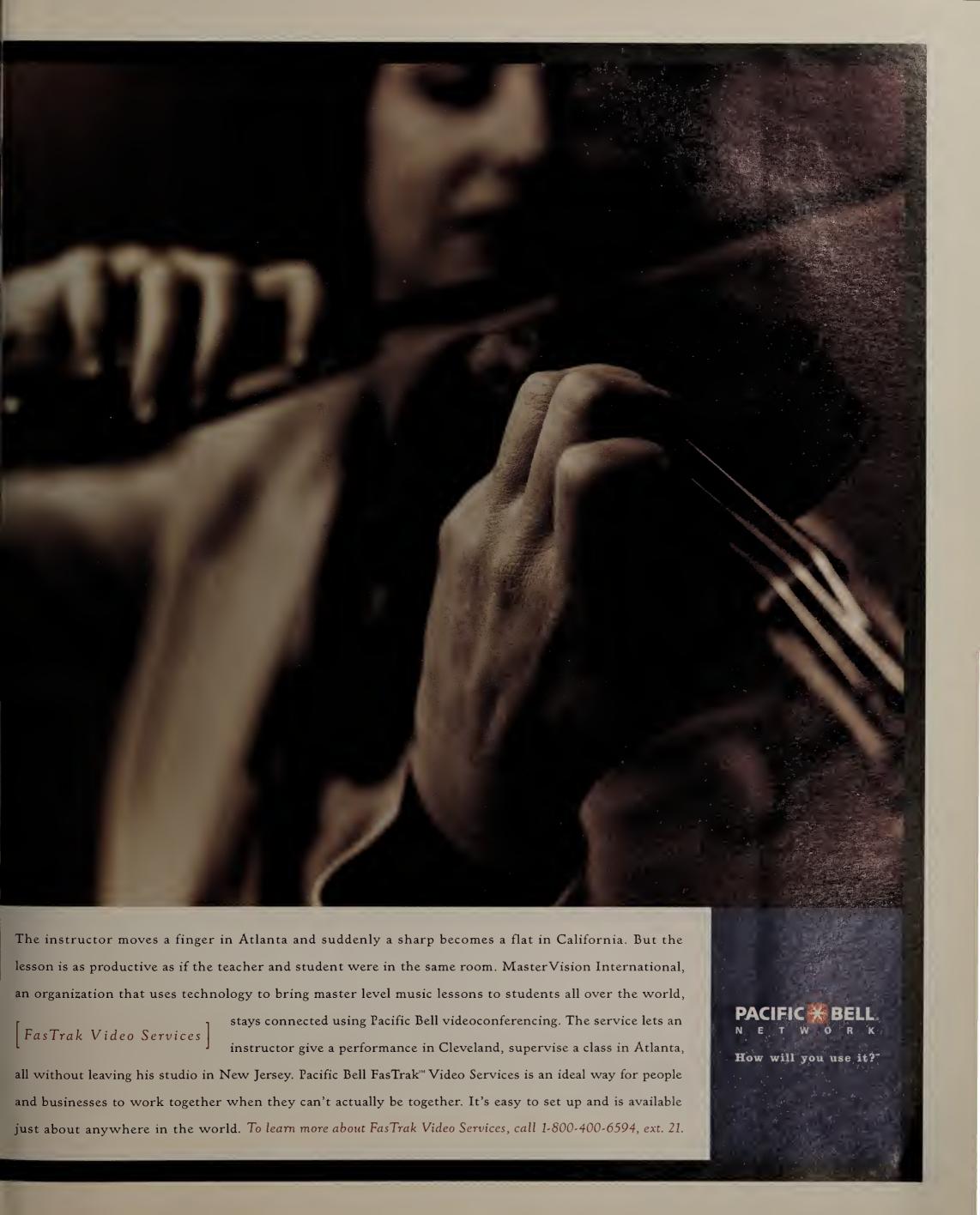
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FRITORIAL INSIGHTS

It's time to name names

K, OK, I know you're busy right now, but I need some help. Fut those end users and CEOs on hold—don't worry, their problems will keep — and take five minutes to drop me a note at jgallant@nww.com.

I want your input for our year-end "Power Players" issue — specifically, your opinion on who really wields power in the network industry.

You see, each year, I put together a piece called "The 25 Most Powerful People in Networking" that's culled from staff recommendations and input from analysts and consultants, as well as advice from readers. This year, I'm pushing for more user input. Toward that end, we're commissioning a telephone survey of subscribers.

But even the biggest survey reaches only a fraction of our 150,000-reader base, so I need you to take a few minutes to tell

me who you think are the most powerful people in networking.

What do I mean by powerful? I'm looking for the people who have a real impact on the technologies our networks are built upon, or who influence the way we use or think about networks

One word of caution: It's easy to come up with names such as Cisco's John Chambers, Microsoft's Bill Gates or AT&T's Robert Allen (although his power is looking a bit shaky these days). Their actions and ideas get lots of ink.

But who holds power behind the scenes?

Who are the customers applying network technology to change their businesses? Which buyers are pushing vendors to change the way they build and support products?

Who are the innovators extending the boundaries of networking, people such as Tim Berners-Lee, the father of the World-Wide Web?

Who are the activists putting key political and social issues, such as privacy and security, into the spotlight?

Please take five minutes today to drop me an E-mail with your candidates and a brief explanation of why you're recommending them. Let me know about the real power brokers in the industry. And thanks for the help.

John Gallant, editor in chief

jgallant@nww.com

Teletoons

By Phil Frank and Joe Troise baba@sfgate.com

It's the first proven method for making money on the Internet... each time an employee logs into a Website with the word "sports" "sex" or jokes" in the URL, the on-line time is automatically deducted from their paycheck.

NETWORK CONVERGENCE

Merger mania adds a new wrinkle to your dealings with carriers and vendors

ecent moves by leading network equipment suppliers — the latest being Lucent Technologies, Inc.'s acquisition of switch maker Agile Networks, Inc. (NW, Oct. 14, page 1) — indicate that another round of attempted network convergence is under way. Vendors are blurring LANs and WANs, routers and switches into inte-

grated product lines to be offered to both enterprise user organizations and carriers.

For users, this convergence offers both opportunity and risk. One outcome is that integrated end-to-end solutions for users' complex LAN/WAN data communications needs might soon become available from carriers. However, there's the risk that the equipment suppliers and their carrier customers are biting off more than they can chew.

At the end of the day, we may see lots of integrated "marketectures" but few, if any, truly interworking products. There's also the risk that betting on one vendor for all your network equipment

needs will leave your enterprise vulnerable to the inevitable missteps experienced in a market where product cycles of 18 months are considered long.

And finally, there's the risk that equipment suppliers will expend so much effort trying to re-architect and integrate divergent products that they will underinvest in up-and-coming solutions, such as IP switching, which could possibly leapfrog much of the current technology.

Both Cisco Systems, Inc. — with its acquisition of StrataCom, Inc. — and Lucent — with its acquisition of Agile

— have the same goal: to create integrated, interoperable product lines that satisfy both the enterprise customer and the carrier market. The two vendors seem to be operating on the theory that carriers will be increasingly important distribution channels for enterprise-level equipment. This is certainly consistent with the carriers' dreams of virtualizing data networks, by extending remote managed data network services into the customer location, and even becoming server centers for enterprise customers' Web and electronic commerce computing and transaction processing requirements.

The \$64,000 question in all this corporate maneuvering is: Do you, the user, really want carriers to provide end-to-end virtual data services, and do you want one vendor to own the entire network equipment product line?

My ongoing work with large users leads me to doubt they will really buy into the concept of complex LAN/WAN virtual data services anytime soon. I'm more likely to hear users complain about the inability of carriers to install or invoice frame relay services correctly than I am to hear about plans for the wholesale transfer of the design, provisioning and operations of the core corporate data network to a carrier. In fact, full-blown outsourcing, in



Mary Johnston Turner

Cisco and Lucent

have the same goal:

to create integrated,

interoperable prod-

uct lines that satisfy

both the enterprise

customer and the

carrier markets.

which the service provider assumes operational responsibility for the existing private enterprise network, is more likely to be under consideration than the use of carriers for anything above the transmission, switching and IP layers of the network.

With midsize users, the story may be a little different. These users may not be big enough to

get highly customized services from any provider other than a local or regional value-added reseller. They often have more homogeneous computing environments and are more likely to be willing to work within the constraints of a packaged carrier service. By their nature, if they are to be profitable, carriers must provide some type of cookie-cutter service that can be replicated across many customers, using a shared infrastructure.

Replicated services mean that the carrier must impose some basic policies and conditions in terms of performance, access, security, billing and so forth. Customers can either take it or leave it. This

is the challenge: To be strategic, data solutions often need to be unique—yet carriers are poorly equipped to implement unique solutions effectively. The more customization needed, the longer it takes to get the service out the door.

If you're not currently a fan of carrier-provided solutions, my best advice is to track your major enterprise equipment suppliers' activities and make sure they don't sacrifice research and development momentum on enterprise-class innovation due to competing needs for carrier-targeted

efforts. If your vendors are doing a good job of meeting your enterprise requirements, it probably doesn't matter where else they dabble, so long as it doesn't distract them.

If, however, end-to-end carrier-provided data networking solutions sound like nirvana to you, either for the core enterprise network or at the edge, the good news is that the equipment suppliers are clearly lining up in your corner. Go carefully on this one, no matter how excited you are by the promises. Early implementations will almost inevitably be based on a single supplier's view of how to implement interoperability across LANs and WANs. Get specific information on how the supplier chosen by your carrier is knitting all these recently acquired technologies together, and think about how it will work with your installed base.

Finally, remember that virtualization of the data network is a fancy name for outsourcing to your carrier. Treat it like any outsourcing deal: Define service levels, monitor results and have a contingency plan for getting out of the deal if it doesn't work.

Turner is a vice president with Northeast Consulting Resources, Inc., a Boston-based consulting company. She can be reached at (617) 654-0619 or via the Internet at turner@ncri.com.

USER VIEW

Major security threats aren't hard to find

By Ben Rothke

Obscure and theoretical computer bugs seem to generate a lot of press at the expense of more mundane, yet major security risks. The fact of the matter is, a great deal of corporate file servers and networks are just plain wide open to attacks.

In late May, the news that some graduate students at Princeton University had found some security flaws within Netscape Communications Corp.'s Navigator browser and SunSoft, Inc.'s Java code

was reported by a range of media, from Network World to CNN. And just last month, computer scientists at Bellcore found a theoretical security flaw with some implementations of smart cards (see http://cnnfn.com/digitaljam/wires/9609/26/ smart_card_wg/index.htm).

Far be it for anyone to minimize these holes, but in all honesty, greater threats are likely to come from much more ordinary sources

Consider the ubiquitous Novell, Inc. NetWare — and soon-to-be ubiquitous Microsoft Corp. Windows NT — file servers. The entire foundation for both NetWare's and NT's security architecture is

built on the premise that the file server will be placed in a secure, tamperproof location. Yet how many times have you seen file servers stored below desks, in open file rooms and in common work

More often than not, the determination as to where the file server should be placed is an afterthought. But if your file server is not in a locked room or secure area, then you have a bigger problem on your hands than the one posed by ambiguous security holes in the Netscape random number generator.

Next, consider the first level of network security—the password. A NetWare network's security system is only as strong as the passwords employed by its users. Other than acts of fraud committed by employees, almost all breaches of security that occur on a Novell network are the result of compromised passwords.

Rather than boning up on the latest exotic computer bug to be discovered, you may be better off installing software that reduces your servers' vulnerability to password-related security breaches. For example, SmartPass, a NetWare Loadable Module from e.g.

Moral support

Al Wright

Tulsa, Okla.

Thanks for Douglas Welch's article

"Fight the support inflation factor" (Sept.

30, page 54). I am a one-man band for a 100-

user, three-server Novell, Inc. NetWare net-

work. Support not only takes up most of my

time, but is also a source of great frustration.

my organization. Maybe a little guilt trip will

be the source of their "emotional buy-in."

Network/systems administrator

AGC Manufacturing Services, Inc.

I will share Welch's article with others in

Software, Inc. of Portland, Ore. (http://www.egsoftware.com), is designed to identify potential password holes on your NetWare servers by scanning user accounts against predefined databases of known weak passwords, such as first and last names, names of famous people and computer jargon. If a weak password is found, SmartPass creates a report for the supervisor, who can then change the password or have SmartPass automatically expire the password,

forcing the user to change it the next time he or she

If you want to see if your users take passwords seriously, try running SmartPass or ScanNT, a similar product for the NT environment from Midwestern Commerce, Inc. (http://www.omna.com/yes/ AndyBaron/pk.htm). You may be shocked to see that your first layer of network security effectively has a sign saying "Crack me!".

If file servers and networks are more likely to be affected by such mundane security threats, why do the obscure and theoretical computer bugs get the press? Because the first person to discover these

exotic holes comes out looking like a hero. It feels great to get your name on the internal mail systems as the one who discovered the

But what about sending a memo to the corporate security officer pointing out that 85% of your company's NetWare and NT file servers lack the most basic security configurations? That's not the least bit glamorous, especially if you end up being assigned to reconfigure those 300 or so servers — on your weekends.

Nonetheless, someone has to do the cleanup. So rather than looking for obscure security flaws thousands of miles away, take a walk to the end of the hall. Look next to the fax machine where the file server sits. Then remove that "Crack me!" sign and make the necessary security changes.

Rothke is a New York-based senior associate with Coopers & Lybrand Consulting, L.L.P.'s Solutions Thru Technology practice. He can be reached via the Internet at 74710.3325@compuserve.com. The views expressed are his own.



MESSAGE Regarding Douglas Welch's article on support inflation: I am the manager of the information technology group for a large investment

banking firm in Dallas.

We support an organization of 275 users in 15 U.S. locations with a staff of four. We are about to increase the size of our group dramatically, especially on the sup-

I have been discussing with my boss the exact trend Welch outlined in his article. He and I both read it and agree that what is beginning to happen in our organization especially with users demanding we do the work for them.

I really enjoyed the suggestions Welch offered in the piece. I'm interested in learning about any other resources or articles on this topic, particularly case studies of companies that alleviated support prob-

Dennis Littlewood IT manager First Southwest Co. Dallas

Readers: Do you have any resource suggestions

or case studies for Dennis? If so, send him E-mail at dlittlewood@firstsw.com.

Don't crown ATM yet

Regarding Dave Buerger's column "Ethernet will not win the high-speed LAN dogfight" (Oct. 7, page 90):

ATM doesn't do broadcasting or multicasting. If the ATM Forum doesn't address these limitations, ATM will never dominate in the LAN market. So before Buerger predicts ATM as the big LAN winner, he should take a look at the basic underlying technology. If ATM is king, well, the king isn't wearing much. (These are my opinions and are not meant to reflect those of my employer.)

Manager of business software development Livingston Enterprises, Inc. Cameron Park, Calif.

Buerger replies: It was not my intention to declare ATM "the winner." I merely said Gigabit Ethernet will not dominate the way many think it will, and ATM will have a more promi-

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Feature

Reservations about RSVP

Taking a reservation is easy; honoring it is the tricky part.

By Thomas Nolle

ou've no doubt heard about all the wonderful things the Resource Reservation Protocol (RSVP) will do for the Internet as well as your internal TCP/IP nets.

A word of advice: You'd be wise to have some reservations of your own about RSVP.

Proponents claim RSVP will not only help corporate intranets support missioncritical applications that are delay-intolerant, but it will make running voice and video over the Internet practical and meld ATM with IP, perhaps even make end-to-end ATM unnecessary.

While it's true RSVP enables applications to request a specific quality-of-service (QoS) level, router vendors are still

struggling to come up with the best way to honor those requests. Even when that happens, you'll be left with the task of ensuring a flood of RSVP requests doesn't chew up every last bit of bandwidth.

Additionally, you'll likely have to pay Internet service providers a premium to use RSVP on the 'Net. And on internal networks, RSVP will require you to either starve some applications so others can

have bandwidth when they want it or add capacity to ensure all requests are ful-

A connectionless problem

While RSVP may eventually work with a mix of network protocols, it is designed primarily for TCP/IP, which uses connectionless datagram services for data transmission. To be fair, RSVP is a good attempt at solving a basic problem in such TCP/IP networks.

Delivering datagrams is inherently a best effort kind of transmission. There is no fixed path for datagrams, or packets of data, to flow across the net. Instead, one node's datagrams are submitted to the network where they compete with datagrams from other nodes for bandwidth.

As a result, there is no easy way to ensure that data flowing between two particular nodes can secure any specified level of performance. In fact, there is no guarantee that individual datagrams will even get to their destinations.

To solve that problem, the Information Sciences Institute of the University of California, the Massachusetts Institute of Technology and Xerox Corp.'s Palo Alto Research Center (PARC) jointly developed RSVP. The objective was to provide a way to establish specific QoS levels for selected data flows that had special requirements for delay avoidance or minimum bandwidth.

The assumption is that many, if not most, of the millions of TCP/IP interactions that already take place every day without high QoS levels won't ever require true QoS. Therefore, RSVP defines a special QoS-controlled information relationship called a session.



RSVP is designed to work primarily with multicast transmissions in which data from one node reaches many others, but it can support point-to-point unicast transmissions (see graphic below).

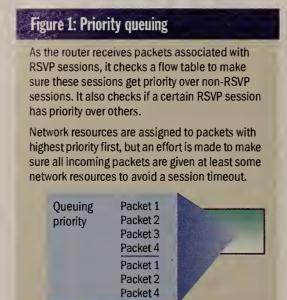
The process starts when a data source such as a server application sends a PATH command to potential recipients. That command includes something called a flow ID that tells routers how to recognize datagrams as part of an RSVP session. The flow ID can include a source address and other fields from TCP/IP headers.

A PATH command also describes the information flow that is about to come, indicating its magnitude, for example. In effect, the source is saying, "Charlie is going to send video. That video transmission can be identified by these bits within the data flow, and it has this set of flow characteristics."

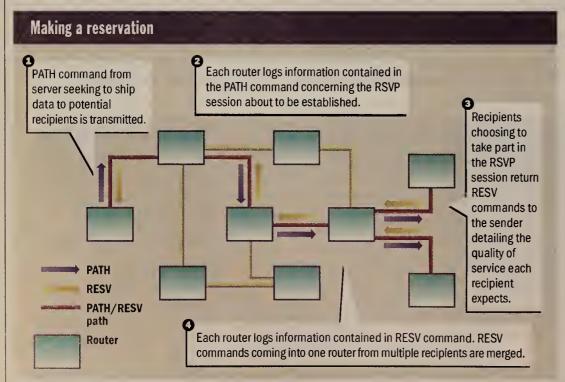
Each router handling the PATH command remembers the flow ID and the trunk it came in on. This enables the routers to map the data flow path and make sure each router is prepared to reserve resources.

When the potential recipients get the PATH command, they send a RESV command if they want to receive the data. Using the same flow ID, the RESV commands follow the reverse route taken by the PATH command, telling the routers along the way what QoS level is expected. A router getting RESV commands from multiple recipients will merge them into a single command.

RSVP has a draft provision for validating QoS requests, but it is not complete and vendors are already developing their own approaches. It will be essential for users or network operators to control the number of people with RSVP access and the priority each can request, or network resources will never accommodate the total requirements.



RSVP also provides for regular exchange of PATH/RESV commands to detect a failure of a node or trunk and reestablish the QoS session. This exchange will also serve as a "keep alive," telling the routers that the session is still active and the flow table must be maintained and resources reserved.



If a router can support the requested QoS, it will enter the reservation in what is called a flow table. Otherwise, the router will refuse the reservation. The way the routers make this decision is largely left up to the vendors.

Routers use flow tables to identify which incoming datagrams are associated with which RSVP sessions. This identification process chews up router processing power. Eventually, if everyone had an RSVP session, the flow tables would get so big, they would make routing tables look efficient, and the whole network would crash.

RSVP performs best when working with a reasonable number of simultaneous reservations. The question is whether you can keep the number of simultaneous reservations within that range.

Keeping the promise, maybe

To answer that question, ask anyone who has ever dined in New York what it's like to make a reservation in a fine restaurant. You can do it, but it doesn't always getyou a table. RSVP works the same way.

The PATH/RESV process that is so central to RSVP doesn't define how reser-

vations are honored. The RSVP draft specification makes fulfilling QoS requests the responsibility of the router's packet scheduler, which defines the order in which data is moved from an incoming router port to an outgoing one. How the packet scheduler does that is neatly left to the router vendor.

Three basic approaches are emerging: a queuing algorithm; a reduction in the amount of processing done on each datagram in an RSVP session; and control of switched virtual circuit parameters.

The queuing algorithm is the most obvious strategy. This process gives datagrams associated with an RSVP session priority over other datagrams according to some scheme of balancing QoS requests for each session (see Figure 1).

In the approach taken by market leader Cisco Systems, Inc., the router employs a weighted fair-queuing algorithm that gives RSVP-designated flows access to trunk resources in proportion to their requested QoS. The algorithm would also ensure that all other flows get at least some resources so that non-RSVP flows would not simply time-out or fail.

Weighted fair queuing is about as good a strategy for allocating router network resources as can be found, but it isn't perfect. There's always the chance that ensuring a minimum level of resources to non-RSVP sessions will require hedging a little on somebody's reservation. In truth, it is probably unreasonable to expect weighted fair queuing to maintain strict QoS in a large network with many RSVP sessions.

This is particularly relevant when there are multiple routers along the information path, each with responsibility for enforcing its own weighted fair-queuing policy.

Furthermore, the routers nearest the source don't always know what the downstream network conditions are, which makes it difficult for the routers to provide the extra bit of capacity the critical flow needs to blast past the clogged resources closer to the recipients.

Reducing the amount of processing that routers need to do on each datagram can also improve the reservation process. There are two ways this can be done: expediting the routing process itself or reducing the number of routers that handle the flows at the IP level by using virtual circuit meshing.

Cisco's tag switching is a way of accomplishing the former. Tag switching reduces router packet processing, thus reducing network delay. Tag switching is a way to make routers behave more like packet switches. What it does is assign an index value to each route entry — a tag — and tells adjacent routers to use that tag to refer to the packets that are to follow that route. This eliminates router table lookup.

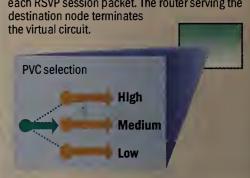
With virtual circuit meshing, on the other hand, you define virtual circuit paths that correspond to various QoS levels. RSVP then steers sessions onto the appropriate paths. This also allows trunk resources to be apportioned according to

the RSVP-specified QoS.

Using virtual circuits in this way means that only two routers — source and destination — will ever handle a data flow. Intermediate routers will simply follow virtual circuit path instructions, which reduces the amount of packet processing at each point (see Figure 2). This technique also shows how RSVP can be used in conjunction with frame relay and ATM, which make broad use of virtual circuits.

Figure 2: RSVP over virtual circuits

A router receiving a sending device's RSVP session data directs traffic to a frame relay or ATM virtual circuit that can meet requested quality of service. Intermediate routers use virtual circuit path instructions to forward data instead of examining each RSVP session packet. The router serving the destination node terminates the virtual circuit.

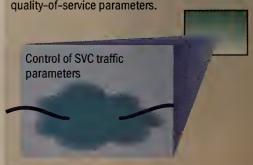


Building a virtual circuit mesh for routers is a key part of Cisco's NetFlow architecture and a fixture of most router vendors' RSVP strategies. But employing this method also creates the "RSVP negates ATM" school of thought. The truth is that ATM may be a major feature in making RSVP practical on a large scale because ATM's use of virtual circuits dovetails nicely with this approach.

Switch vendors are adopting an approach of having RSVP sessions control the QoS parameters used to set up ATM or frame relay switched virtual circuits (see Figure 3).

Figure 3: RSVP over switched virtual circuits

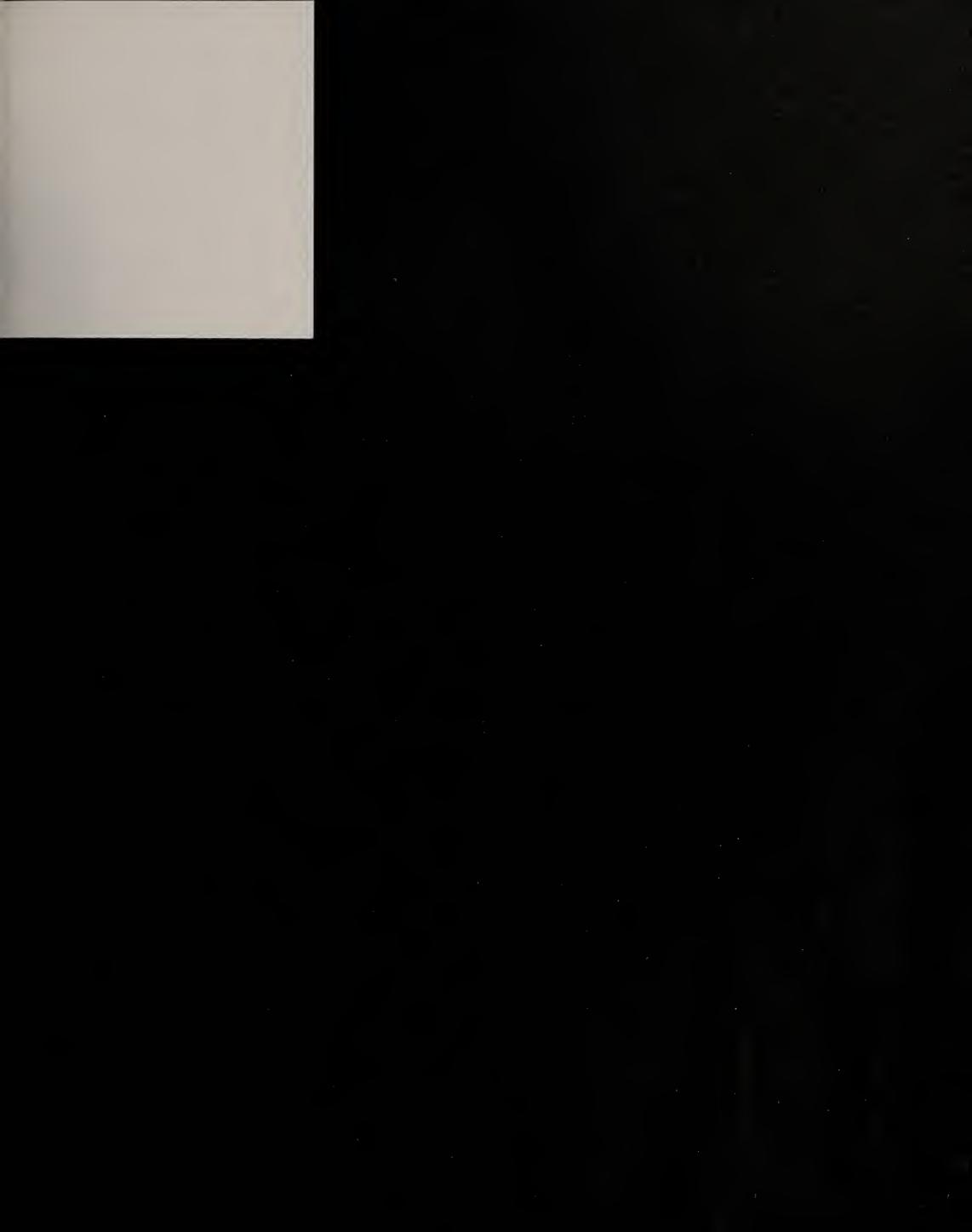
When switches are used to control RSVP sessions, they will tap information used in the RSVP session request process to establish frame relay or ATM switched virtual circuits that meet requested quality of sension parameters.

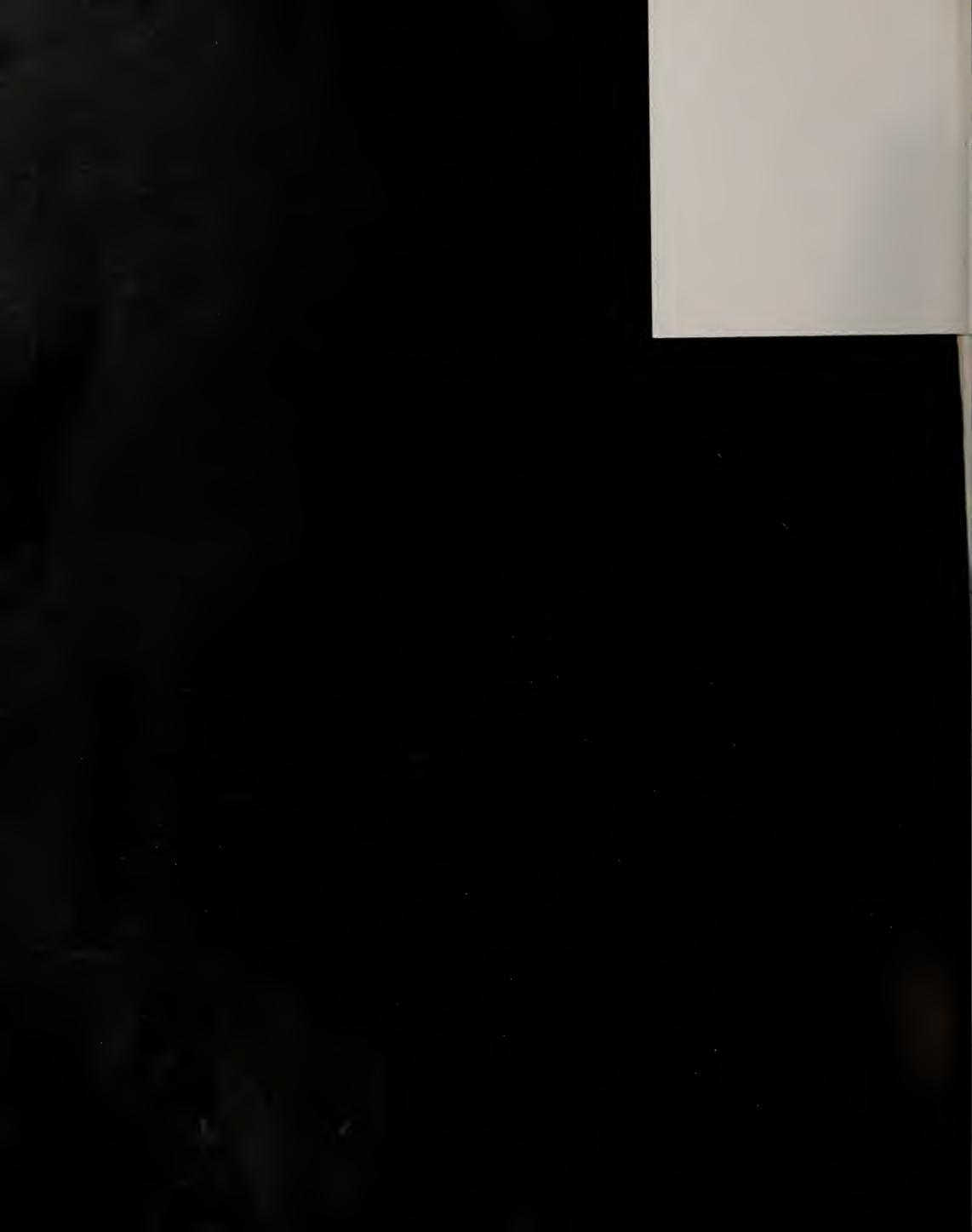


When used this way, RSVP augments the basic features of LAN-to-ATM architectures such as LAN emulation and Multi-Protocol over ATM. Because there is no QoS support built into today's LAN-to-ATM architectures, switch vendors say using RSVP can actually help ATM become successful.

RSVP's limits

Two problems remain no matter what approach is used. First, RSVP can't do more than divide the network resource







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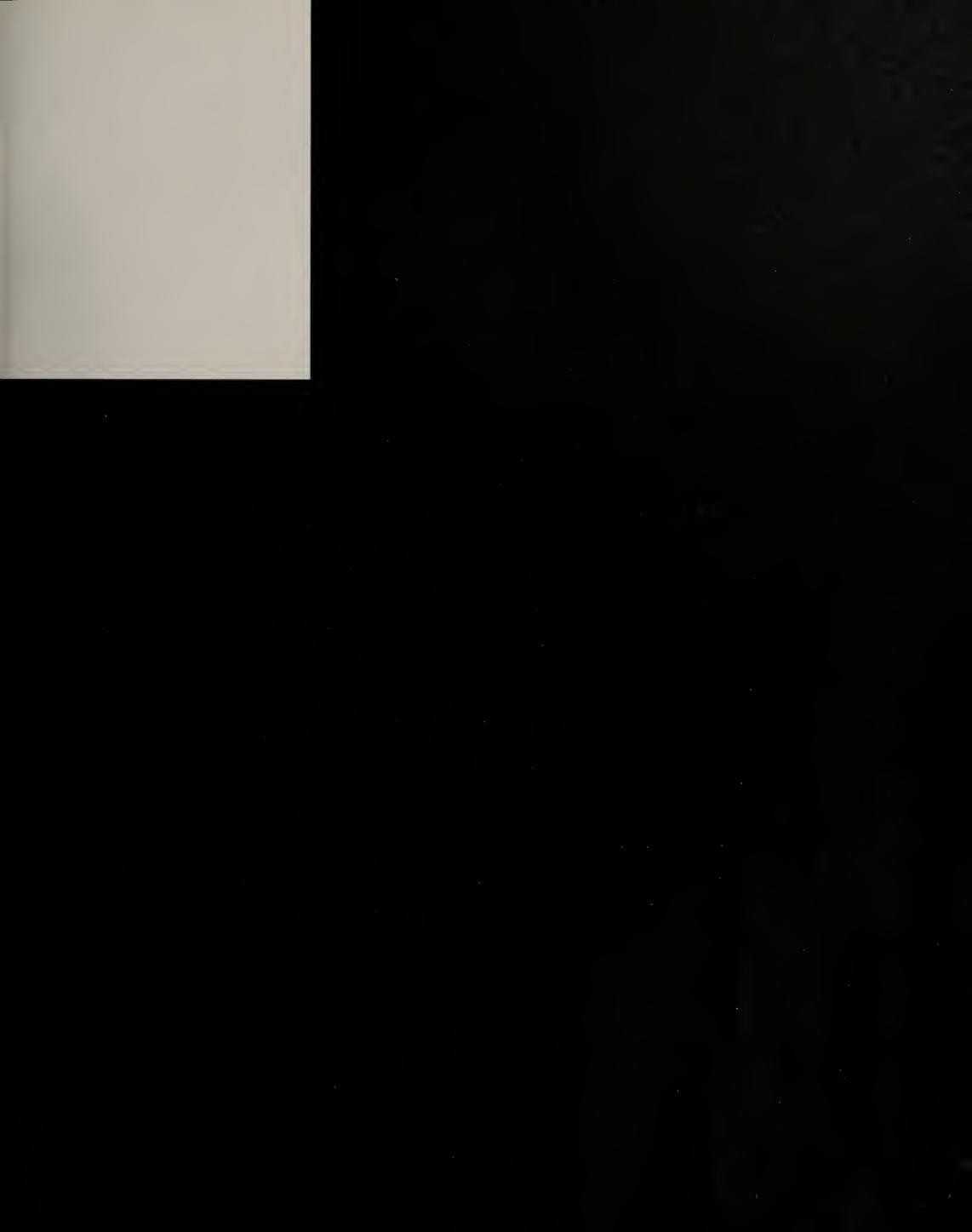
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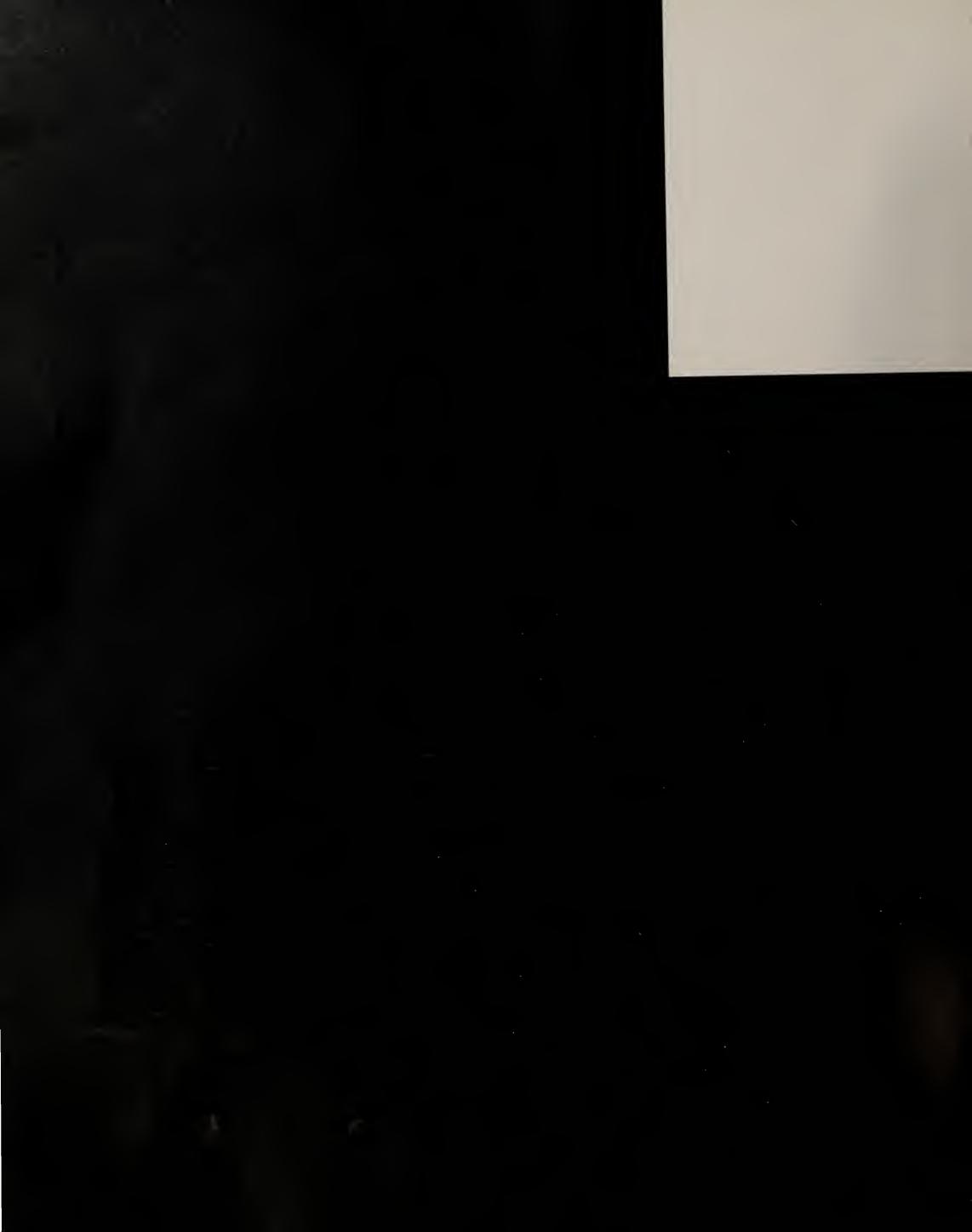
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pie differently. This, and the inherent limits in the number of simultaneous RSVP sessions routers can effectively manage, makes RSVP most useful when there is a relatively small number of priority data

Here's the truth:

RSVP is just as

likely to em-

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media as you're

willing to pay for

-which you

could have done

anyway.

flows with modest bandwidth needs.

Furthermore, the RSVP draft doesn't define how the PATH/RESV process would code different values of QoS, or exactly what aspects of performance - peak/average bandwidth, delay and datagram discard rate — might be subject to RSVP control. This means the process of making reservations would have to be matched to the way routers or switches interpret them. As the three approaches demonstrate, there is a lot of latitude in fulfilling reservation requests. And latitude, when it comes to

standards, means no interoper-

ability.

Implementation issues aside, there are other limits to RSVP. There are really no applications today that can make use of it, and making current applications RSVP-aware is nontrivial.

To understand what's really missing with RSVP in an application sense, let's start with the process of making a reservation. Who makes the reservation? Presumably, the process starts with an ap-

plication that can generate PATH commands. Where is that application today? There is a basic RSVP API described in the draft, but nobody has applications that use it. It's unlikely new applications will be written to the API anytime soon because RSVP features are not yet built into operating systems.

Another way to get RSVP-aware applications is to write them using a QoS-sensitive API such as WinSock 2. This approach will become practical as Windows NT 4.0 and future WinSock 2 versions of Windows 95 are deployed. However, this approach is only good for newly developed applications or those rewritten for WinSock 2.

Still, because WinSock 2 will become pervasive by about 1998, this is probably the wellspring for future RSVP applications.

Yet another approach uses an RSVP

dialer program that runs independently of the real application. The program's sole purpose is to make an RSVP reservation and maintain the RSVP keep-alive process. Because the application sending and receiving the data doesn't have to know RSVP is in use, this approach works well with existing applications. This same dialer could be used as a conference scheduler. A number of vendors are pursuing development of such schedulers, but none have made their activities public.

For new areas such as Internet voice or video, the barriers of RSVP application support can be easily overcome. A new application could emit RSVP PATH and RESV commands as IP datagrams. In fact, there are vendors developing products

NAME RECOGNITION

In late 1995, a CIMI Corp. study

showed less than 5% of 147

companies surveyed were familiar

with the term "RSVP." Just last

month, the number was up to 60%

in a survey of 108 companies, and

there were hundreds of press

releases on the wires heralding

vendor support of RSVP.

that would allow local cable companies or competitive access providers to use the Internet as an interexchange voice service. There is voice-over-IP already support for private networks, and at least one vendor team — Micom Communications Corp. and Northern Telecom, Inc. — has promised a product that will enable RSVP to be used for sending voice over IP.

Does this mean the application problem is solved? Hardly. This is where the second, and most insidious, problem of RSVP surfaces. Remember the point about robbing one application to meet the reservation requirements of another? When an ISP uses RSVP on the Internet to set aside bandwidth for a customer's multimedia transmission, someone has to pay for those reserved resources. Guess who that someone is.

You want an ISP to honor your bandwidth reservation for multimedia? No problem, as long as you pay for it.

If no adjustment were made to the ISP's pricing policy to charge for RSVP sessions, users could send a flood of multimedia traffic that would quickly swamp current capacity, and, without a revenue increase, the ISP could not afford to create additional capacity. Obviously, that isn't going to happen.

When RSVP is installed in ISP networks, it will certainly mean those carriers will charge a premium for each RSVP session. The implementation of RSVP that ISPs demand will have a journaling capability that provides input to a billing system; so the ISP can track which users requested and received RSVP sessions.

The same holds true for corporate networks. You can run mission-critical applications and voice over your intranets with RSVP as long as you're willing to pay for the extra capacity or starve other applications. The concept that voice can ride for free over data networks is a cruel myth. If bandwidth were free, then everyone could have so much that reservations and prioritization would be unnecessary.

In fact, RSVP is not a bandwidth concept; it's a billing concept. It's a way to get those who want more quality to pay a higher price. IP has never provided that option, and for users that need to target bandwidth investment at specific applications, RSVP is the best choice. But don't delude yourself into thinking that RSVP is a free way to get more traffic on low-cost Internet links.

Some vendors think RSVP is disposable. The new Ipsilon Networks, Inc. approach to QoS management examines datagram headers to prioritize traffic, based on a set of rules you define. The problem with this approach is that what distinguishes an application's importance may not necessarily be readily extracted from a datagram header.

In the final analysis, only the people who are involved in an information relationship know how critical it is. RSVP lets them tell the network that, and RSVP is good for that reason. But on the downside, RSVP doesn't ensure the network can do anything with the knowledge.

So, is RSVP a fraud? The concept clearly has value, but the way it's promoted may be a bit

disingenuous. If you're interested in RSVP and QoS control, and can solve your problems by reallocating rather than adding resources, RSVP may be your thing—eventually. If you think it will solve your congestion problems, dream on.

Here's the truth: RSVP is just as likely to empower ATM as to eliminate it. It will let you do as much multimedia as you're willing to pay for — which you could have done anyway. At this point in time, RSVP is not standardized.



It's also not interoperable, and it's not something you can go out and touch unless you're an unusually technical organization.

Above all, the impact of RSVP on the Internet will be to allow for stratified levels of service and the pricing structures that accompany them.

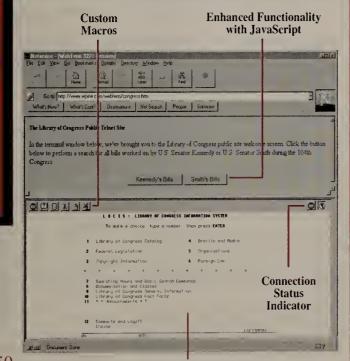
Hey, it's a capitalist world. You get what you pay for.

Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004 or via the Internet at the located in Corp. com.



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Workgroup star power

By William Rinko-Gay and Lee Schlesinger

This month's servers are all winners. Digital Equipment Corp.'s Prioris ZX 5166 would have been the fastest workgroup server we've ever tested — had it not been surpassed by Hewlett-Packard Co.'s NetServer LH Pro, also reviewed in this issue. While Tangent Technologies' Alcazar II only placed in the middle of the pack for performance, its ultralow price makes it a big winner for value, as measured by our price/performance index.

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A lower number indicates better value. The best index to date is 120, while the poorest is 370.



The same chassis that we saw on Prioris HX 5166 in our Aug. 19 issue now houses a 166-MHz Pentium processor with 1M byte of dedicated Level 2 cache. The upgrades propelled the new Prioris to the second-best performance we've seen among workgroup servers.

You can upgrade this Prioris to four 166-MHz Pentium processors with 1M

byte of Level 2 cache each. That's a lot of power in a small box that also includes hot-swappable drives, redundant fans, room for a redundant power supply and a pair of integrated Adaptec Corp. 7870P SCSI controllers. With NT clustering and available RAID drive controllers from Digital, these machines should be very reliable.

Like the previous Prioris models we've seen, the machine can be opened without tools, making service a snap. A key holds covers for the external and hot-plug drives shut.

The same key can be used to unlock the side panels — one to grant access to the motherboard, and the other to gain access to the drive area and power supply. The chassis sits on wheels to make it easy to move around. There's a complete configuration reference on the sticker under the door of the server's right side.

All of this is of limited use without good performance to back it up. Fortunately, the Prioris ZX 5166 also has this. The powerful memory architecture helped it score first in the NT database

test and second in all other tests except for the NetWare file server test. Its surprisingly low score in this test suggests that Digital did not properly tune this machine for NetWare file server performance.

Digital bundles ServerWorks 2.0 — which includes ServerWorks Manager 1.1 server management software, ServerWorks Quick Launch software installation support software and ServerWorks ManageWorks workgroup administration software — with the Prioris.

ServerWorks Manager requires the SNMP service to be running in the server, yet the installation program didn't warn us of this, nor did it install or start the SNMP service. Once over that hurdle, the program worked reasonably well. Some of the alarm-setting options were difficult to find on the menu, but we eventually managed without having to revert to the manual. Version 2.0, due out by the time you read this, should offer improvements, but we were unable to evaluate it in time for this review.

We used ServerWorks Quick Launch to install Windows NT 3.51. It took us seamlessly through everything except network adapter configuration. It even installed Service Pack 4 — the latest from Microsoft Corp. at the time. However, the system did not detect the server's Intel Corp. EtherExpress Pro 100 PCI. When we tried to install it man-

ually, the software prompted us for the distribution medium but couldn't find the CD-ROM we specified. This was partly our fault because we didn't know the current drive letter of the CD, but there was no way to go in and find out. Digital should incorporate a browse feature.

Digital's printed documentation was complete. We had no trouble getting in and around it.

Toll-free, seven-day, 24-hour support plus a three-year, on-site warranty help to make the Prioris ZX 5166 headachefree

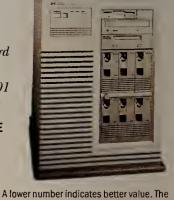
WORKGROUP SERVER

NetServer LH Pro

VENDOR:
Hewlett-Packard
CONTACT:

(415) 857-1501 PRICE: \$8,527 PERFORMANCE





est is 370.

Once again, an HP server proves a super performer. The LH Pro turned in the best performance we've found to

PERFORMANCE LEADERS TO DATE

Our performance rating is derived by adding the file server performance in scripts per minute to the average of the two application server test results at the 16-client level.

Issue tested	Top performance
This issue	52.0
This issue	46.1
6/24/96	45.8
4/22/96	41.5
8/19/96	41.4
	This issue This issue 6/24/96 4/22/96

VALUE LEADERS TO DATE

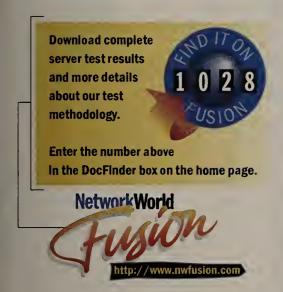
We divide the price of the server as tested by the performance rating to get our price/performance index. A lower number indicates better value.

Workgroup servers	issue tested	Price/ performance index
Tangent Alcazar II	This issue	120
Digital Prioris XL Server 5133	4/22/96	143
AcerAltos 900	6/24/96	147
HP NetServer LH Pro	This issue	164
Unisys Aquanta ES	7/22/96	173

NetworkWorld PCWORLD SERVER TEST SERIES

date among workgroup servers on the strength of first- and second-place finishes in our file server tests in NT and NetWare, respectively, and a first-place finish in our Notes test, which runs under NT.

Part of the reason must be the four disks that go along with the two integrated Adaptec SCSI adapters. The NT database score comes in at No. 4, and the NetWare database score comes in at No. 1.



Consistent with the NT file service score, the Notes score, run under NT, also put HP in first.

This machine is designed a lot like the previous HP NetServer LH model we've seen. This 200-MHz Pentium Probased system can actually accept two processors, although one proved plenty powerful.

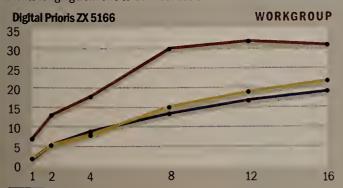
HP's NetServer Assistant management application comes with each Net-

You can set thresholds for the software to alert you when components are about to fail.

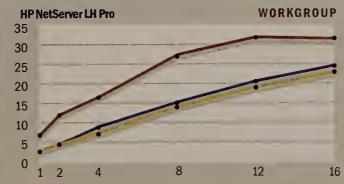
Vendor	Digital Equipmen	nt Corp.	Hewlett-Packar	d Co.	Tangent Techno	logies	
Model	Prioris ZX 5166		NetServer LH Pro)	Alcazar II		
Processor	166-MHz Pentiun 2 cache	n with 1M-byte Level	200-MHz Pentiu Level 2 cache	m Pro with 256K-byte	166-MHz Penitur Level 2 cache	m with 512K-byte	
Max. processors	Four 166-MHz Pe Level 2 cache each	ntium with 1M-byte ch	Two 200-MHz Per Level 2 cache	ntium Pro with 512K-byte	Dual 200-MHz Pentium with 512K-byte Level 2 cache		
Memory	As tested	Maximum	As tested	Maximum	As tested	Maximum	
_	32M bytes	768M bytes	32M bytes	1G byte	32M bytes	512M bytes	
Slots	Provided	Open	Provided	Open	Provided	Open	
EISA	4	4	4	3	4	4	
PCI/EISA	2	2	1	1	1	0	
PCI	3	2	4	4	3	0	
Processor	0	0	1	0	0	0	
Bays	Provided	Open	Provided	Open	Provided	Open	
Internal	0	0	0	0	0	1	
External	1	7	9	3	5	0	
Storage						-	
Adapter	Adaptec AIC-787	0	Dual integrated i	Adaptec AIC-7870P	Dual CMD 6520u PCI		
Bus	Fast Wide SCSI		Fast Wide SCSI		Fast SCSI-2		
Capacity	4.2G bytes		4G bytes		4.2G bytes		
Model	Seagate ST3255	OW	Seagate ST3121130WC		Seagate Barracuda ST32550N		
Maximum drive	Internal	External	Internal	External	Internal	External	
capacity	28G bytes	1T byte	54G bytes		36G bytes	90G bytes	
CD-ROM	Toshiba XM5401	TA 4X SCSI	Toshiba XM5401	.B 4X SCSI	Toshiba 6.7X SCSI		
Network adapter	Intel EtherExpress	s Pro 100 PCI	HP 10/100TX PCI		Cogent EM110 PCI		
Fault-tolerance features	failover fans, opti redundant power Remote Server M	rives, ECC memory, onal RAID, optional supplies, optional anager, Integrated lager, optional clustering	ECC memory standard Drive array available		Hot-swappable drives, redundant powe supplies Dual adapters can be configured for mirroring via NOS		
Security features		assword, diskette lockout, t, two locks on chassis	Start-up password, server mode, keyboard lock, case lock Can disable serial port and floppy		Drive locks, chassis locks		
Bundled software	including ServerV ServerWorks Mar Workgroup Admir	e of manageability tools Vorks Quick Launch nager 1.1, ServerWorks nistrator, ServerWorks tion and SNMP agents	NetServer Assistant (server management software), Information Assistant, Diagnostic Assistant		NetTune Pro NetWare monitoring and analysis tool		
Miscellaneous	Seven-day, 24-ho three-year on-site	our toll-free support, e next-day service	Seven-day, 24-hour toll-free support, three-year on-site service		Five-day, 10-hour toll-free support, sev day, 24-hour support at additional cost three-year (one-year on-site support), additional on-site available, each configuration custom-built, NetWare can be pre-installed		

PERFORMANCE SUMMARY

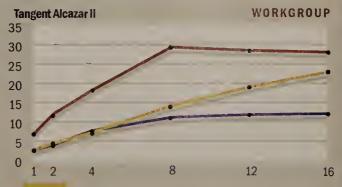
We measure performance from the client's point of view and report the time it takes to complete typical tasks. Our performance summary graphs show the results of each test in scripts per minute with numbers of clients ranging from one to 16. Because the tests run faster than a real client could perform the operations, each of our test clients stresses the servers as much as several real users would.



FILE SERVER Our file server tests run scripts on ascending numbers of clients for four applications: Microsoft's Word and Excel for Windows, Lotus' 1-2-3 for Windows and Corel's WordPerfect for Windows. The scripts perform file access operations, such as opening, importing and saving files.



DATABASE We have two application server tests. The first is a client/server database test that uses Microsoft Access on the front end and Oracle Server 7.2.2 on the back end. We perform various read and write operations on a three-table payroll management application.



LOTUS NOTES The other application server test uses Lotus Notes Release 4.0. We access multiple views in a database, then each document within each view.

You can also examine the state of the server, check out storage usage statistics and even restart the server from HP OpenView (also included).

Another option you have is to remotely manage the server from an EISA modem card that will operate even if the server has

NetServer Navigator is also included

on a bootable CD-ROM, along with utilities to help with configuration of the Net-Server, installation of the operating system and online documentation.

This documentation is easy to navigate. We were a bit intimidated by the size of the release notes in the initial Read

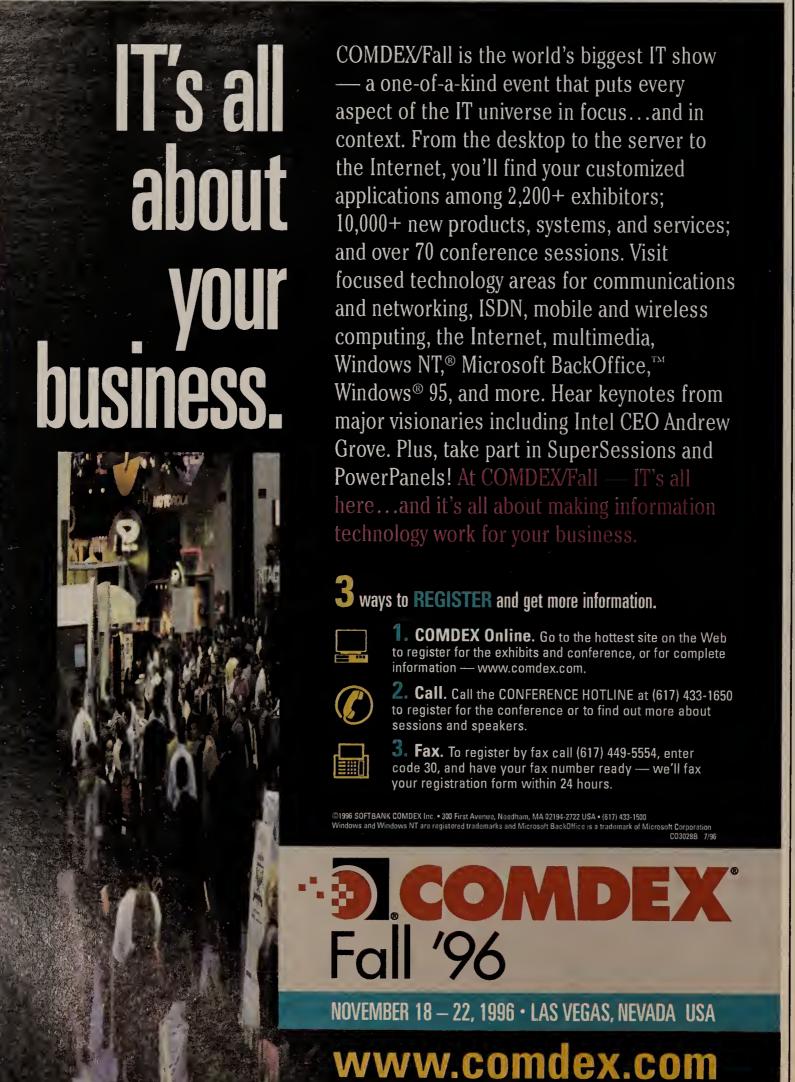
However, everything you need to know

to set up and run the server is clearly explained. For those tasks that would make booting from CD-ROM impossible — initial server setup and installing Net-Server Assistant — there is printed documentation.

While HP does not provide a network operating system (NOS) installation tool, NetServer Navigator does have a Configuration Assistant to help with EISA configuration and the creation of driver diskettes. The first screen we saw on the NetWare and NT 3.51 Configuration Assistant warned us that the network interface card it detected wasn't recommended with the

However, this appears to have been a version conflict and should be corrected

This server is a super performer, and it's also a good value with a price of



WORKGROUP SERVER Alcazar II

VENDOR: Tangent **CONTACT:**

(415) 342-9388 PRICE: \$4,295

PERFORMANCE RATING: 35.7





his server has the best index to date.

Tangent's Alcazar II is much smaller and better suited to its task than the Carthage that we reviewed previously (NW, May 27, page 51). And its rock-bottom \$4,295 price, combined with reasonable NetWare performance, make it an attractive choice for NetWare workgroups.

Windows NT is another story. The Alcazar II came in last in our NT File Server test. Obviously, even with two controllers and two drives, the system is not well tuned for NT file service.

Still, its price/performance index of 120 is the best we've seen among all the servers we've tested to date.

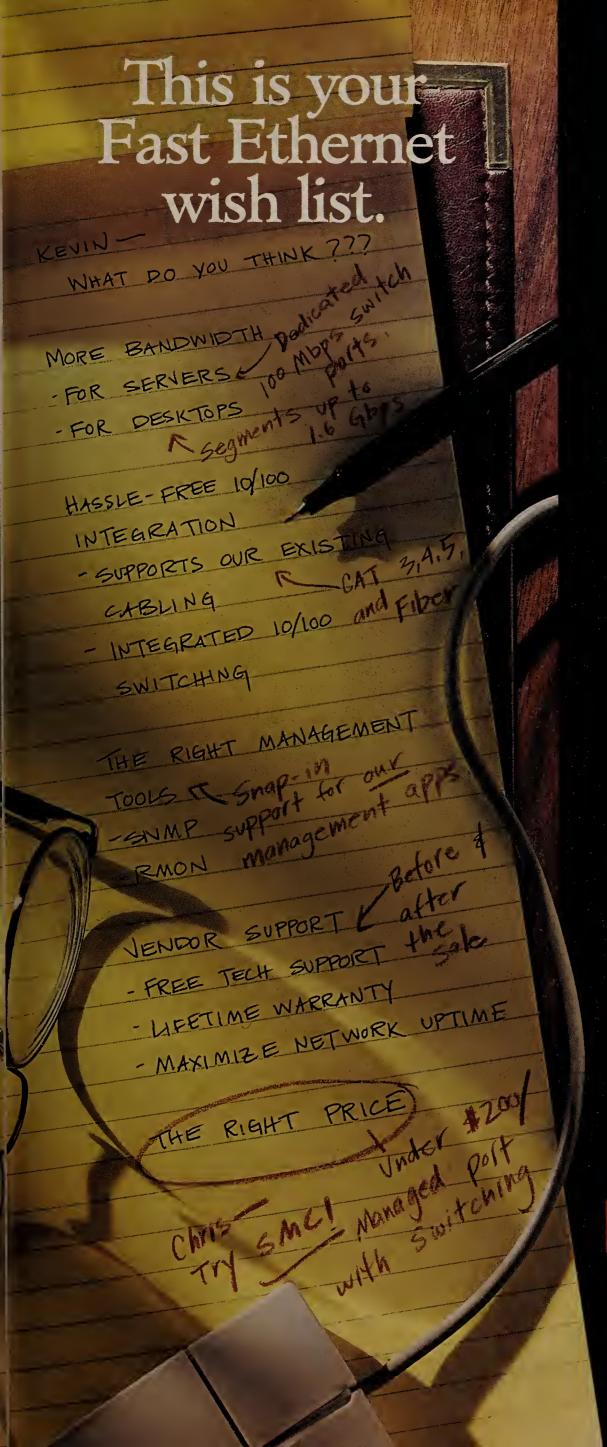
We were surprised to find an ISA bus instead of EISA inside the Alcazar II. Tan gent obviously expects you to meet al your high-performance adapter need with the PCI bus.

The inside of the Alcazar II is easy to maintain, with a lot less wasted space than the Carthage. The hard drives are hot swappable with the use of the Kensington $5 \frac{1}{4}$ -inch bays.

Tangent doesn't have "standard" models. Each configuration is built to order, based on customer needs. Model are flexible — for example, the chassi can be modified to provide a Personal Sy: tem/2-style mouse port. Tangent pre installs NetWare, and bundles BMt Software, Inc.'s NetTune Pro for optimi: ing your NetWare installation. Docume tation is adequate with several OEN manuals and a good system manual from Tangent.

Tangent technical support is available toll-free, 10 hours a day, five days a weel Around-the-clock support is available for an additional cost.

Standard warranty is three years o parts and labor with one year of on-si support. A second year of on-site is al!



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When I have a question, I know exactly where to call. It made perfect sense," Brown says.

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Management Strategies

Covering: Career Insights and Innovations in Managing Staff, Budgets and Technology

Briefs

In National Education Training Group (NETG) will develop a set of interactive multimedia training programs for Netscape Communications Corp. called the Internet Master Series.

The programs will cover basic and advanced Internet/intranet technologies, including networking fundamentals, introduction to the Web, TCP/IP, SNMP, Common Management Information Protocol over TCP/IP, Web server administration, Web security, HTML and Java.

The complete suite of training programs is scheduled to hit the market by March 1997. Pricing has not yet been set.

NETG: (800) 265-1900.

■ Prosoft, Inc. this month began offering training courses at the G.A. Sullivan headquarters in St. Louis.

The partnership will enable Prosoft, an Internet training company to offer courses at all levels to businesses of all sizes in the St. Louis area. The G.A. Sullivan site will feature a state-of-the-art classroom, equipped with 20 Pentium-based systems and connected to the Internet via a T-1 link.

G.A. Sullivan, a software development services company, will use the facility to improve the Internet training curriculum for its customers.

Prosoft: (888) 776-7638.

Talent retention starts with you

Balanced workloads, unwavering support and attainable goals can keep employees happy.

By Douglas Welch

You've heard it so many times before: No one's irreplaceable. Try telling that to someone who's just lost the most talented person on staff. Unless there is someone of equal talent waiting in the wings, the loss of all those years of experience will be felt for months to come, as the search for a comparable replacement drags on.

It's enough to make shorthanded managers wish they'd done more to induce their brightest talent into shoving competitors' offers aside. While it's true that you may not be able to prevent the departure of someone who's really decided to move on, you can make jumping ship appear less attractive.

It all starts with keeping your people happy. A good first step in that direction is to avoid excessive overtime and the burnout it can cause.

When overtime becomes a regular occurrence instead of the occasional need to snub out an unexpected fire, there is a serious management problem. Instead of continually pushing people to work 50, 60 or more hours a week, check to make sure projects are being planned realistically. Perhaps a larger staff is needed or end users need more training so they don't overtax your support staff. Whatever the

problem, excessive overtime will quickly drive staffers to jobs where 40 hours is considered the norm

Stand by your people

Another step in the right direction is to let staff know

bureaucracy that stands in the way of getting their jobs done. For example, you can hammer out a compromise with an accounting manager to revamp burdensome purchase order procedures for new equipment or streamline the process for

the loyalty between employer and employee that has been scarred by downsizing.

While there may not be much you can do to prevent executives from trimming positions to be responsive to shareholders, you can understand that downsizing introduces fear as a motivator. Fearful that they may lose their jobs, good people will seek employment elsewhere.

HINTS FROM MANAGERS

if you want to retain your brightest talent, try what these managers suggest:



"Set some achievable goals. While creative people will tell you they hate boundaries, all humans need to know limits and have targets worth striving for. Without achievable goals, it just leaves money as the only measure of success."

> —Mitch Krayton, president of Digital Resources, a graphics hardware and software vendor in Van Nuys, Calif.

"Don't work your best employees to death. Just because they're good doesn't mean you can give them all the work you can't get anyone else to complete."

—Eric Martin, a software engineer in the Los Angeles entertainment industry



"Allow them time to play while on the clock. Not games, though. Let them play on the Internet, read trade magazines, or find new gizmos or utilities and try them out. During playtime, they can come up with an obscure doo-dad that saves the day in an emergency."

-Ric Turner, a technical specialist at a major entertainment company in Los Angeles

you'll go to bat for them when something isn't right. This might include battling excessive approval of project plans.

Supporting your staff when its called for can aid in gaining back

Review your review process

Anything you can do to reduce fear is well worth the effort, and that includes making performance reviews a positive experience rather than a discipline tool. Reviews are often conducted too infrequently and are used to point out the negatives in performance.

Reviews should be done more than once a year. In fact, every meeting between a manager and staffer should be considered part of the review process. Nothing is more distressing for an employee than being blindsided during a review with a problem that occurred months ago or one that has already been corrected.

In addition to regularly scheduled reviews, a postmortem review should be performed at the end of each major project. This enables you to review events while they are still fresh in everyone's mind. Any lessons learned can then be applied immediately to ongoing projects, and you can set goals for the employee.

The long and short is that retaining valued workers helps keep companies successful. When star performers leave, they take their knowledge with them even if you've attempted to capture it in a knowledge base. That knowledge can, and often does, go straight to a competitor.

So isn't it better for everyone involved to retain talented employees? They might be more difficult to replace than you think.

Welch is the former director of MIS for Hollywod Online, a major Internet content provider, and is now a computer consultant and freelance writer in Van Nuys, Calif. He can be reached at dewelch@ earthlink.net.

NETWORK BOOK REPORT

Lotus Notes for Web Workgroups
Robert Dale and Barbara Opyt (Santa Fe, N.M.: OnWord Press),
257 pp., \$34.95. Phone: (888) 763-8786; ISBN:
1-56690-110-3. To find out more

This book shows you how to use Lotus Development Corp.'s Notes and its companion product, InterNotes, to transform the Internet into a virtual private WAN and to extend workgroups.

Featured in a narrative and tutorial format are discussions on Notes/Internet connectivity, security and replication, workflow and document management for Web publishing, Notes database integration and InterNotes use. Scattered throughout are topic-related Web site addresses that you can visit for additional information.

To find out more about these books, follow the links to

follow the links to their publishers' Web sites from Network World Fusion.

Type the number above in the DocFinder box on the home page.



James T. Geier (New York: McGraw-Hill), 319 pp., \$45. Phone: (800) 262-4729; ISBN: 0-07-023034-X.

Reengineering has been a key business buzzword during the past few years. Now you can find out what some of the important factors are that influence a company to modify its network as part of a reengineering effort.

The author also tries to show how you can—without continual reinvestment—keep existing networks in line with management plans for the future, application changes and shifts in technologies.

Guidance on requirements analysis and network redesign and implementation is also given.



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The Visual Computing Software Company 6303 Carpinteria Avenue Carpinteria, CA 93013 USA http://www.metatools.com

Programmer/Analyst: Design and develop middleware software layer for communication between design, and develop a totally scalable architecture for a call logging process; be responsible for the creation and ongoing maintenance and performance tuning of production, training, and test databases. Development environment is PowerBuilder, with Oracle 7.2 as the back end database on an HP-9000 (UNIX). Position requires bachelor's degree in Computer Science or similar major and two years prior experience in this position or as a Systems Analyst. Prior experience must include experience with an HP-9000 under a UNIX operating system using Oracle Forms, Pro*C, and Visual Basic programming tools. 40 hrs/wk; 8am-5pm; salary of \$60,000/yr. Send resume with Social Secu-No. to Indiana Dept. of Workforce Development, 10 N Senate Ave., Indianapolis, 1N 46204-2277, Attn: Sean M. Blancaneaux. Include 1D#3450322 with response. Applicants must be eligible for permanent employment in the United States.



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 MS SQt Server DBA consolidated investment databases; develop SQR programs for reports generation using MITI SQR Workbench on Win-APPLICATIONS DEVELOPMENT Business Analyst/Programmer Inside Sales Managers
Strategic Account Managers
Customer Support Specialists

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ATTN: J.O. #TN6200341.

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Qualifications include: BS in engineering or equivalent experience; NOS experience; CNE, MCP, MSE preferred; Unix shell script experience and C++ programming a plus; licensed electricians strongly encouraged to apply. Please inclicate job type and geographic preference. Job code: JK-0032

HARDWARE/FIRMWARE ENGINEERING

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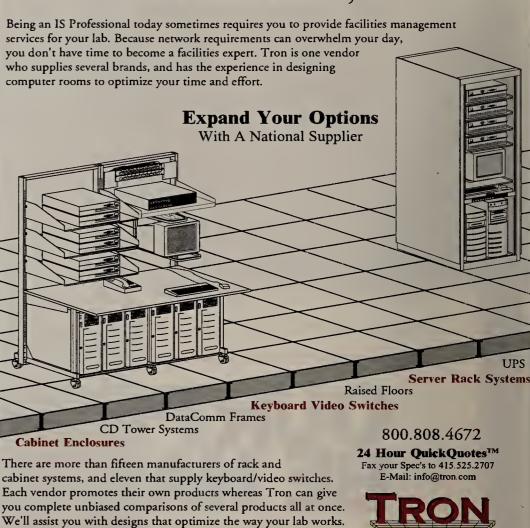
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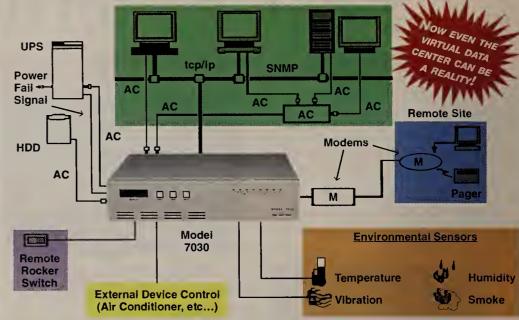








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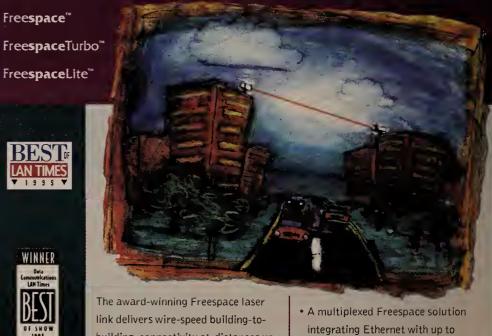
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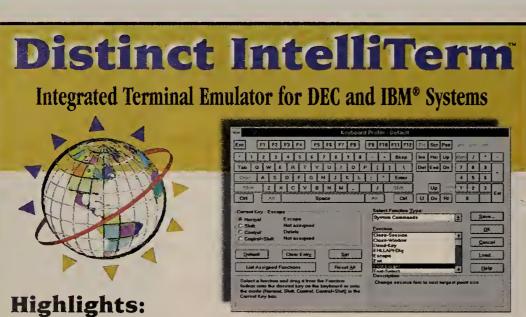
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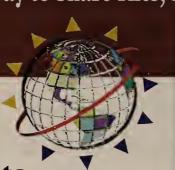
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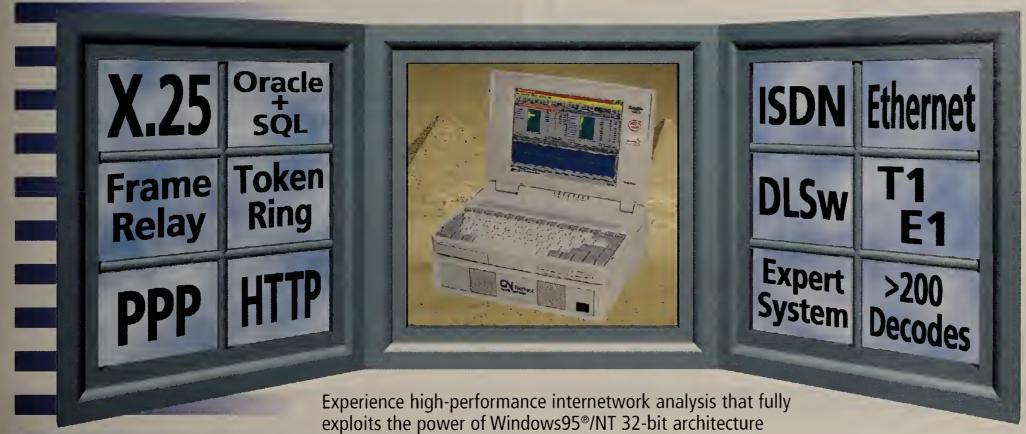
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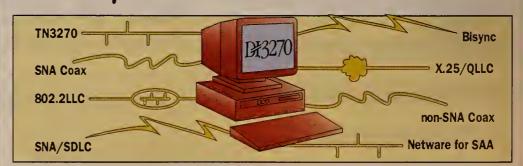
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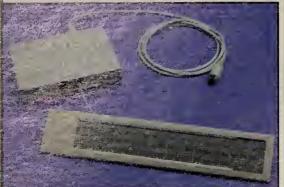




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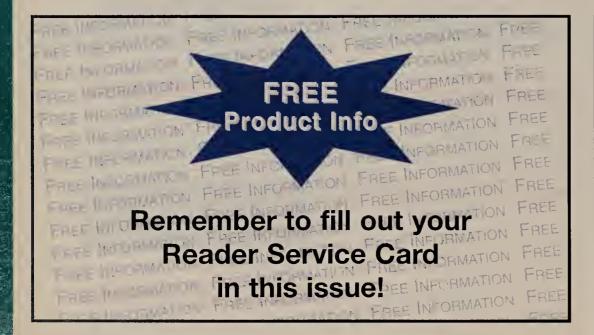
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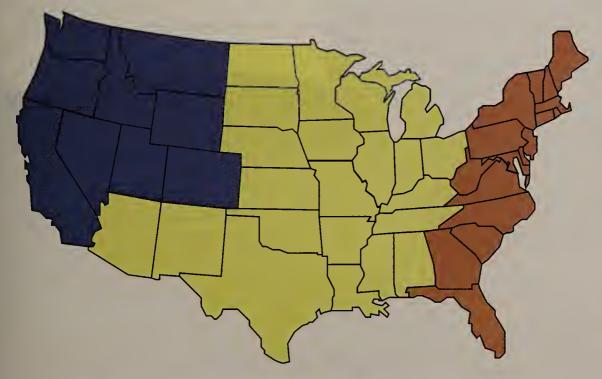
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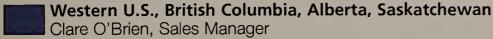
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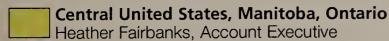
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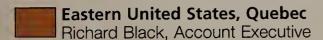
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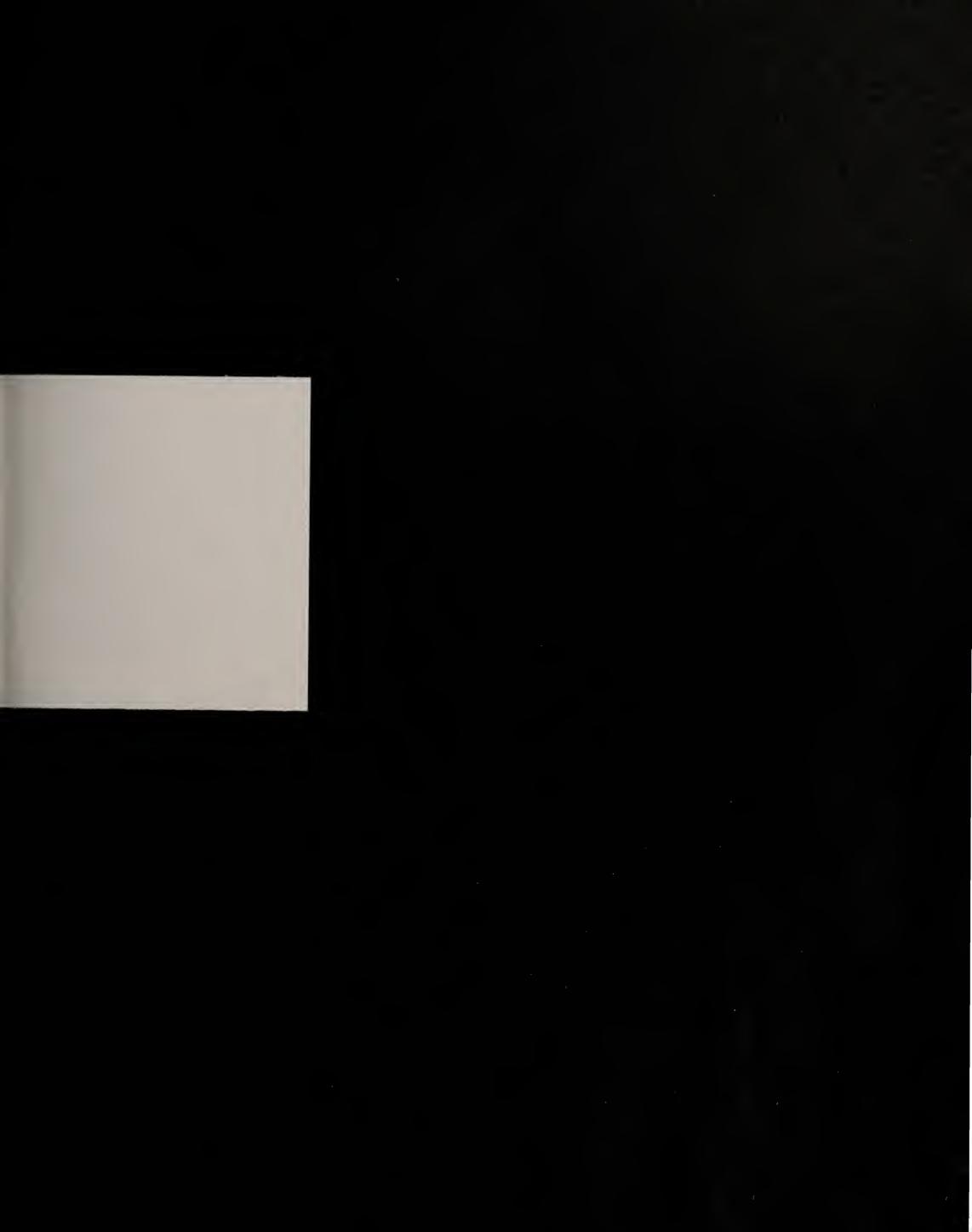
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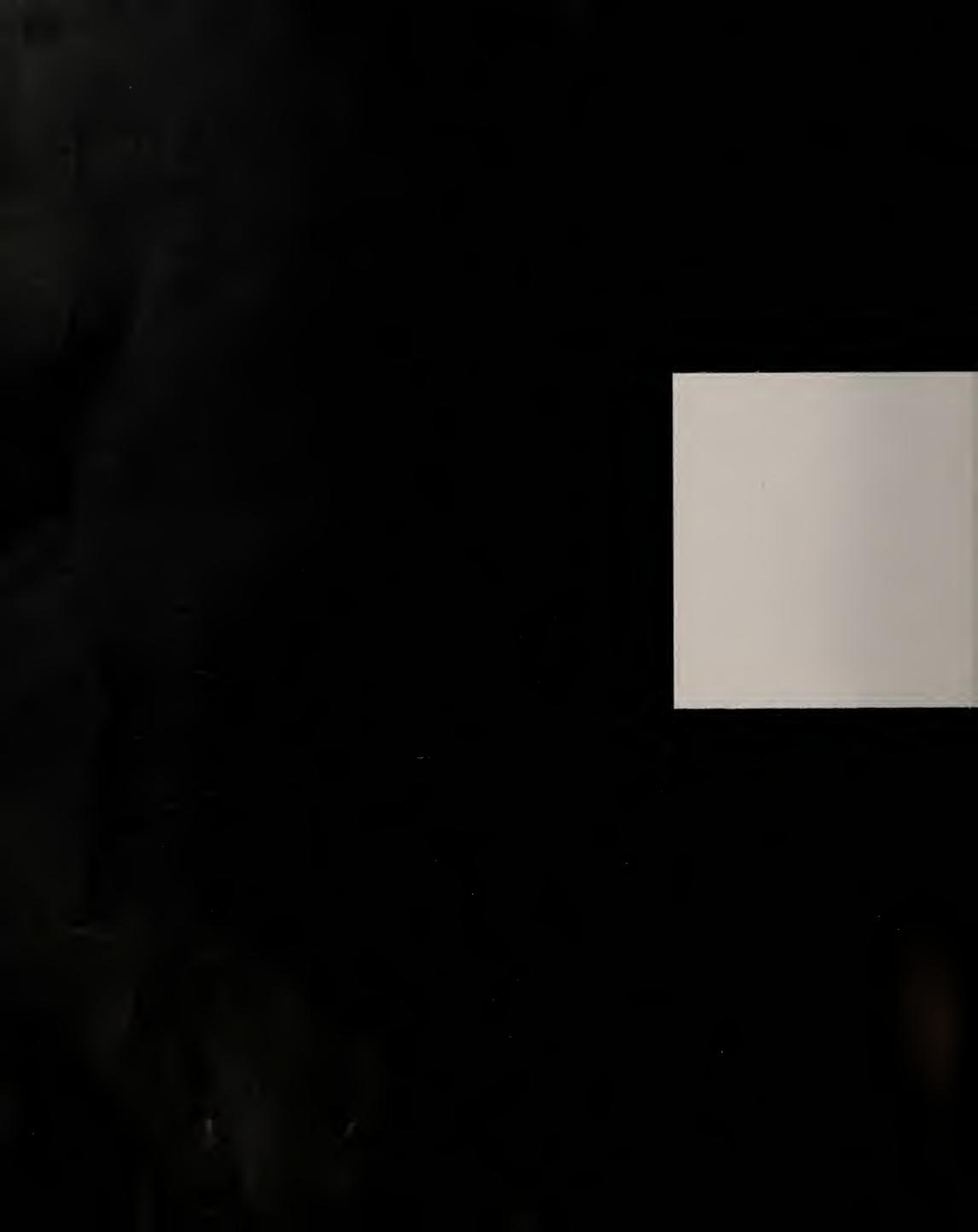
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VLAN

Continued from page 1

"Our network used to be too big and flat, which caused broadcast storms so bad that workstations would often lock up 10 times a day," Heilweil said. "VLANs helped us get away from that by creating virtual subnets, and now our broadcast traffic is under control."

VIANs confine broadcast frames so they only reach destinations in the same subnet, freeing "noninterested" hosts on other VLANs from having to process irrelevant frames, he explained.

VLANs also give Heilweil a great deal of flexibility with adds, moves and changes by allowing him to quickly redefine memberships as users move around the network

John Scoggin, chief technical advisor in the telecommunications infrastructure

services unit at Delmarva Power & Light Co. in Wilmington, Del., agreed.

"VLANs are very helpful when you've got a very mobile company that picks up and moves offices frequently or has functional units that are dispersed among multiple buildings," he said.

Another key benefit is the ability to centralize servers. VLANs let net administrators concentrate servers physically, which makes it easier to manage them, while providing dispersed users with access to the servers via assorted VLANs.

Jeff Marshall, senior managing director of communications technologies at Bear, Stearns & Company, Inc. in New York, used VLANs to relocate the firm's NetWare, Unix and Windows NT servers to a single facility. This simplified management and lowered operational costs, he said.

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Pat Walker Traffic Manager

Missing the mark

But when it comes to more advanced features, VLANs miss the mark, industry observers said.

For example, customers looking to set up logical subnets according to applications are mostly out of luck. Currently, most switches only define VLANs by port, media access control (MAC) address, network address or protocol (see graphic).

"If you want application-specific

VLAN VARIETY

A sampling of the most popular ways to configure virtual LANs:

- ▶ Port assignment: Customers can establish VLANs by assigning certain router and switch ports to specific VLANs. These logical groupings are easy for net managers to set up initially. However, endstations cannot be moved without reconfiguring the VLAN.
- MAC address: Defining VLANs by a media access control address allows for mobility because the address moves with the endstation. But membership is still static because net administrators have to manually enter each endstation's 48-bit address into VLAN configuration applications.
- ▶ Network address: Users can group endstations into virtual subnets based on their network layer address or protocol, such as IP or IPX. The benefit is dynamic membership, where endstations are automatically assigned to a VLAN. But it is difficult to assign endstations to multiple VLANs because the net address is still bound to the endstation.

VLANs (Lotus Notes, Web browsers, E-mail, etc.), then there has to be a level of support from the application providers," Morency said.

Just as Intel Corp. partnered with Cisco Systems, Inc. in March to incorporate the Cisco VLAN technology into Intel Fast

Ethernet adapter cards, the switch vendors need such companies as Lotus Development Corp. to work with them, he said.

"Otherwise, [switch vendors] end up getting stuck in neutral, delivering just the basic VLAN benefits of adds, moves and changes," Morency said.

Another high-end feature that is missing is the ability to control and assign bandwidth to a particular VLAN, one analyst said.

"I've talked to end users that are very interested in creating VLANs for people who do Web browsing," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo., who is hosting the Switched Networks & VLANs conference here this week.

"By controlling the amount of bandwidth that a VLAN has, Web browsing doesn't interfere with other kinds of network activities," he said.

McConnell estimated that the industry is about six to nine months away from see-

ing products with these types of policy-based VLAN capabilities.

Management madness

The lack of these high-end features contributes to the difficulty customers are having managing their switched virtual nets. But the IEEE also needs to nail down a standard so vendors can start building interoperable VLAN management applications, users and analysts said.

"VLAN management tools have to correlate events happening across multiple switches so I don't have to figure out what's duplicate information," Heilweil said.

The IEEE 802.1q VLAN standard — expected to be finalized late next year — will determine VLAN frame formats, membership rules and management procedures, said Karl Shimada, vice president of market research at Rising Star Research, a consultancy in Lakewood, Colo.

"The group realizes that its biggest challenge is defining how to manage these virtual nets," he said. "If [VLANs are] not easy to manage, the group has accomplished nothing."

Once the standard is set, VLANs should make network management easier, Heilweil said.

"If I want to know about traffic patterns across the backbone, for instance, not only will I have the standard level of granularity that shows me what everyone on the physical network is doing, but I might be able to look at a particular logical subnet and see the way it's moving data," he said.

Also, Heilweil said it would be helpful if protocol analyzers could know about VLANs so they could run collections in a global fashion and then break down the

> data according to logical subnets for a net manager to review.

But getting to this level of VLAN management may take time, Shimada said. "You don't just go overnight from managing physical segments to this virtual workgroup idea that we have in the ATM world," he said. "VLANs can actually provide that bridge to ATM."

For example, vendors will likely roll out switches that have ATM uplinks where VLANs are defined on the legacy side and are translated by the switch into the ATM virtual networking side, Shimada said.

"If we do the standard right, [this bridge to ATM] will be one of the beauties of virtual LANs," he said. "If we do it wrong, it will be

chaos.''

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In fact, according to Shimada, if the standard does not provide a new, easier way to manage the network, then the IEEE 802.1q group will have completely failed. ■

Opposing virtual LAN views



Not everyone sees eye to eye on the benefits of virtual LANs, and you can count consultants David Passmore

and John McConnell in that group. They recently shared their opposing VLAN views with Network World Senior Writer Jodi Cohen.



David Passmore, president of Decisis, inc. in Herndon, Va.

On VLAN benefits:

VLANs help adds, moves changes. But most people have already

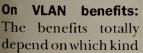
solved this problem using Dynamic Host Configuration Protocol (DHCP). In fact, the big benefit of DHCP over VLANs is that DHCP is a solution that works today with people's shared-media LANs, since most people have shared Ethernet or token-ring nets. VLANs don't buy you anything until you move to a totally switched environment where you give everybody their own dedicated port into the network.

Another benefit is that VLANs let you control or contain broadcasts within your network. This is one of the areas in which VLANs may prove their value.

On VLAN limitations: One drawback is [a lack of] multivendor interoperability. Today, if you want to know that VLANs are supported across network switching devices, you're going to need to buy all those [switches] from the same vendor. You also have to worry about NIC card support if you want to have a server or workstation simultaneously belong to more than a single VLAN.

On VLAN management: If I start using VLANs, I now need another piece of software — a VLAN management application —that I didn't have to have before. And it may not be very well integrated with my router management application or my physical network management application. So, rather than making life easier, I may have just complicated my life by deploying VLANs.

John McConnell, president of McConneil Consuiting, inc. in Bouider,





have deployed. Let's start with port-based VLANs, which give us traffic control. We can set up how traffic is contained no matter where people go, but [VLANs] do not help us with address management or adds, moves and changes. MAC-based VLANs help control traffic and also help automate adds, moves and changes. But they don't do a lot to help address man-

agement. When we get to the network layer, things get a lot juicier. Now we can have help with moves, adds and changes and traffic control, and we can simplify our address administration.

On VLAN management: If the IEEE 802.1q group can get its act together so we have standard tagging, then protocol analyzers and RMON agents, etc. will be able to understand which packets belong to which VLANs and give us much more insight into behavior.

Also, how do we start to make this information [collected by] VLAN management tools more widely available to the rest of the management environment? We need a lot more integration.

The other area that needs more strengthening is the ability to describe and invent policies. But that's going to be a longer term effort since we don't really understand what policies are effective right now.



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Domino

Continued from page 1

an analyst at META Group, Inc. in Stamford, Conn. "[Lotus]

needs to have brand recognition as a provider of Web services, so they are willing to market Domino to a certain extent without saying Notes," he said. Lotus owner IBM reportedly favors the Domino nomenclature.

Sources close to the company said one possibility is that Lotus will wind up pushing Dom-

ino as a server brand and billing Notes as client software that offers advanced mail features and local replication.

The current Domino is a set of software services that turn Notes into a Web server. It is available now as a download on the company's Web site and will be packaged with Notes Release 4.5 by year-end.

Users applauded the plan to eliminate Domino's depen-

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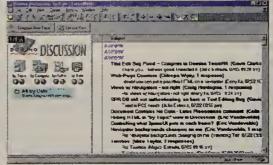
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dence on Notes. "The market would welcome that as an alternative to having this huge piece of code that includes Domino and Notes," said Alan Baren, a



Domino: Notes on the Web

manager for the strategic technology group at Coopers & Lybrand in New York, a large Notes shop that is also adding Domino to many of its servers.

Recent moves by Lotus have raised some eyebrows. First, the company has started running ads for Domino that barely mention Notes. Second, Lotus just renamed its NetApps line of Web applications to reflect the Domino brand. For instance, Net. Action is now called Domino.Action. In addition, the company will host the first Domino developers' conference next month in Anaheim, Calif.

Tim Dempsey, director of Notes product marketing at Lotus, said Domino has a lot of momentum, but no branding

decisions have been made. "We're thinking about this a lot, but Notes is still strong," he said.

Cain said pushing the Domino name allows Lotus to appeal to companies that may have overlooked Notes for groupware but are willing to consider Domino as a platform for Webbased collaborative applications. It also

takes the Notes name out of circulation following a period when several analysts pronounced

IN THE WORKS

Lotus is betatesting Domino 1.5, which will include enhanced application development capabilities, calendaring and scheduling features, as well as the ability to attach files to Web pages.

Notes dead at the hands of the Web. Cain said.

"Lotus can't sell Web servers using the Notes name,' agreed David Marshak, an analyst at Seybold Patricia Group, Inc., a market research firm in Boston. "The question is, what happens to Notes?"

Marshak there is a possibility that IBM will offer

Web servers. "None of them may be called Domino or Notes," he said.

VNV

Continued from page 1

interoperable management platform that can manage disparate switch platforms," said Switch-Soft President and Chief Executive Tyrone Pike.

VNV runs on Windows 95 and Windows NT clients and servers. From VNV's User Browser task, administrators can statically or dynamically assign users to VLANs according to port, media access control address, network address or endstation user name.

The relationships between company sites and switch connectivity can be viewed from VNV's Hardware Browser. And the software's Visual Network Browser provides access to views showing VLAN memberships, as well as the relationships of VLANs to other VLANs.

Those views are stored in VNV's Containment Editor and Pipe Editor tasks. Containment Editor keeps data on overlapping VLAN membership, while Pipe Editor provides a crossbar view of VLAN connectivity and interrelationships.

All displayed VNV views can be updated in real time to reflect any status or network state changes. Also, switch hardware management modules can be integrated into the VNV architecture, according to SwitchSoft.

Currently, VNV works with UB Networks, Inc. devices, but at the VLAN and Switching conference, SwitchSoft will announce VNV support for Cisco Systems, Inc.'s Catalyst 5000 switches, Pike said. VNV will be able to recognize Cisco's 802.10 and Inter-Switch Link trunking protocols for VLAN frame tagging across FDDI and Fast Ethernet backbones, respectively.

Ultimately, SwitchSoft plans to extend VNV functions to rout-

ers, remote computing gear and firewall software, Pike said. Also, SwitchSoft plans to more tightly integrate VNV with the leading network management platforms, he said.

Virtual nightmare

Even though VLANs might make reconfiguration easier, tracking which user belongs to which workgroup, and whether they belong to more than one virtual segment, has become a night-

"a pain and a gain." This, in turn, is complicated by making sure users get the information they need without being inundated with unnecessary broadcasts. And all of these issues have to be handled with business processes in mind.

"It has a lot to do with corpo-

rations changing their legal structures, and building joint ventures and needing to actually divide the network they have presently into private virtual networks," Pike said. "It's not advis-

> able just to let your broadcasts go everywhere and leave your network as one large switch domain."

Despite critics who say VLANs are more trouble than they're worth, Pike says VLAN planning is in "very high gear" among corporations, and test beds are being de-

ployed for some very large virtual

SwitchSoft is looking to line up some OEM partnerships for VNV and is in discussion with several switch manufacturers, Pike said.

He declined to disclose which vendors, however.

SwitchSoft has offices in Orem, Utah, and Woodside, Calif., and employs a staff of 20.

The company was founded in August after Pike and other officials from UB Networks acquired UB's Utah Development Center in a leveraged buy-

As for the general state of VLAN affairs, Pike said VLAN critics are only seeing half the

"There's a pain and a gain," Pike said. "At this point, it's clear that some of the first implementations of VLAN management were awkward and, therefore, the pain was pretty high. But the gain is you can have a much higher degree of security in the network. That starts to have some very meaningful value for people." ■

Network security

VPNet offers IP security blanket

SoftSwitch's Pike

says VLANs present

By Tim Greene

San Jose, Calif.

Start-up VPNet Technologies, Inc. will introduce later this year an inexpensive way for users to carve out virtual private networks (VPN) on the Internet and other public networks.

VPNet gear was designed to operate secure intranets and support remote access to corporate LANs over any public network. VPNet equipment combines IP encryption, compression and authentication in one package.

While VPNet is not introducing any breakthrough technology, it does offer a bundle of proven and useful security tools

at what seems a reasonable price, said Fred McClimans, an analyst at CurrentAnalysis, Inc.

McClimans said VPNet's gear is unique for now, but he expects other vendors to follow soon with similar offerings.

In December, VPNet will ship the VSU-1000, a stand-alone box make it easier for companies to that processes traffic up to full T-1 speed, or 1.5M bit/sec. It has a list price of \$3,995. The VSU-1000 sits between the router and the DSU/CSU port to the WAN, and supports both IP and frame relay.

> During the first quarter of next year, VPNet will package the system for integration with routers that have built-in DSUs/ CSUs. That package, called the

VPU-3000, will process traffic at T-3 speed, or 45M bit/sec. The company has plans to push that to 155M bit/sec, or OC-3. Pricing has not been set.

The VPNet devices perform bulk data encryption following the Data Encryption Standard (DES) and Triple-DES standards. They also reject altered or forged packets through MD-5 hashing functionality.

Initially, the products will support Simple Keys for IP, an encryption-key management protocol. The VPNet architecture, called VPLink, was designed to support other protocols as they prove themselves.

To keep throughput high, VPLink compresses IP packets before they are encrypted to keep them as small as possible after encryption headers are added.

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INDEPENDENT TEST RESULTS

Information addicts of the world, unite; you have only your brains to gain

nfoglut. I have no idea who coined the term. (And please don't write and tell me. I don't care; it is not a pretty word.) The concept of infoglut is that we have more information coming at us than we can cope with.

Actually, I don't know why it's called "info"-glut. After all, it can't be information unless it is useful to us.

As Professor Peter Drucker wrote: "Information is data imbued with meaning and purpose." And we can hardly glorify the tumultuous tons of stuff that comes pouring out of every electronic spigot as information.

Therefore, we will now switch over to the far more accurate "dataglut." But guess what? I digress.

Nowit is generally held that dataglut is a bad thing. Pundits everywhere decry the dataglut as distracting, confusing and obfuscating (which should always be eschewed).

They also point out that our attention spans have decreased, and our ability to prioritize and rank information (data) decreases in direct relation to the amount of data we have to deal with. If the pundits are to be believed, the dataglut will fry our brains.

Nowit certainly is true that we live in a much more event-rich world than our ancestors.

I heard on some erudite program the other day that a weekday edition of *The New York Times* contains more news about the world than someone living in the 17th century would have received over the course of a lifetime.

While this is desperately interesting, it should not be seen as a problem. In the intervening 200 years, the world has become a much more complex place, and we've adapted to it. Holding up these examples as evidence that we are suffering in some way, seems more like reflexive Ludditism than a realistic assessment of the human condition in the western world.

I believe the dataglut is good, and all the claptrap** and whining that goes on — "We have more information than we need"—is a waste of time. There is absolutely nothing we can do about it. That's the way the world is. Our only choice is to buck up and deal with it.

Learn to live with the dataglut and develop techniques to profit from it. Use it as a competitive weapon because it isn't going away anytime soon.

For a start, learn to live with the dataglut, develop techniques to profit from it and use that flood of data as a competitive weapon.

At the very least, relax, lie back and enjoy, 'cause it ain't going away.

Now although the following looks like a digression, bear with me. I live on a hill and get to see all kinds of interesting air traffic passing by.

I told my wife the other day that I'd love to get radar, so I could track the planes.

She said, in not so many words, that I am an information

addict

Mark Gibbs

You know what? She is right. And I'm proud of it.

My willingness to deal with the huge flood of data provides me with what I need to do business (though I admit that tracking local aircraft may be just a little over the top).

So the message of this week's sermon is: Stop complaining, and use the dataglut for what it's worth: making us effective competitors.

How do you deal with the dataglut? Let me know at mgibbs@gibbs.com or leave a message at (800) 622-1108, Ext. 504. Will I be seeing you at my intranet seminar in Chicago next week? If not, why? Call (800) 643-4668.

* "The Coming of the New Organization," from the *Harvard Business Review* back in, I think, the '70s, but I'm writing this on an airplane, so I can't look it up.

** Etymology alert: AT-shirt for the first convincing wild surmise on the origin of "claptrap."

LAN cache software can speed tired nets at low cost

ag, rag, rag. Any conversation between a user and network manager invariably comes down to this lament: "Why is the (fill in the blank) so slow?" Network managers thus focus their work on making the (fill in the blank) faster, hoping to keep users off their backs.

Vendors love this plight. Just look outside your door. They're lining up to sell you faster PCs, servers, adapters, cables, hubs, switches, routers and other gear suited for an Indy-class network.

Fortunately, you don't always have to replace hardware just to boost response times, particularly when the bottleneck is loading applications and files over a network.

tions and files over a network.

New uses of familiar caching technology will often do the trick for a fraction of what you'd pay for costly hardware upgrades.

Caching has been around for ages. A cache is a block of computer memory that stores instructions and data transferred to and from a disk drive. Caching improves PC and server performance by keeping frequently used information handy.

Vendors have been boosting performance by caching server-based applications and data on networked PCs.

Several vendors have taken caching one step further to boost network performance. It's a simple idea: caching serverbased applications and data on networked PCs. Long application launch times can thus be cut to a few seconds. Improvements are most noticeable when the processor in question is separated from the server by wireless or dial-up wide-area connections or low-speed LAN links.

Happy users stop complaining. Life is good.

But there are other benefits. Cutting redundant read requests to application servers will free up server capacity—as much as 80% according to one vendor. Faster LANs don't solve this problem.

Caching also cuts network traffic.

Experts say that as much as three-fourths of all network file traffic comes from people requesting the same files used within a two-day period. Using caching to keep files local might help delay the need to upgrade to faster network technology.

Network cache products cost about \$50 to \$100 per PC. Such products include Shared LAN Cache from Measurement Techniques, Inc. (www.lancache.com), Netgain from NetStream,

Inc. (www.netstream.com) and Powersoft from Shiva Corp. subsidiary AirSoft, Inc. (www.airsoft.com).

Evaluation copies are available from each Web site.

These products create a disk-based cache, which means server-based applications and data files are cached on each PC's hard disk,

not in memory. That is done for a few reasons:

- Disk-based caching is nonvolatile, which means you won't lose the cached data during a power loss or other system seizure. Caching is always optimized, even when you power on the PC.
- People can continue working with data even if a server connection goes down.

 This is crucial for workers with dial-up connections. Cached data on the PC is

synchronized with the server once the link resumes.

■ A physical disk drive offers more storage than memory, which is usually consumed with running the operating system and applications.

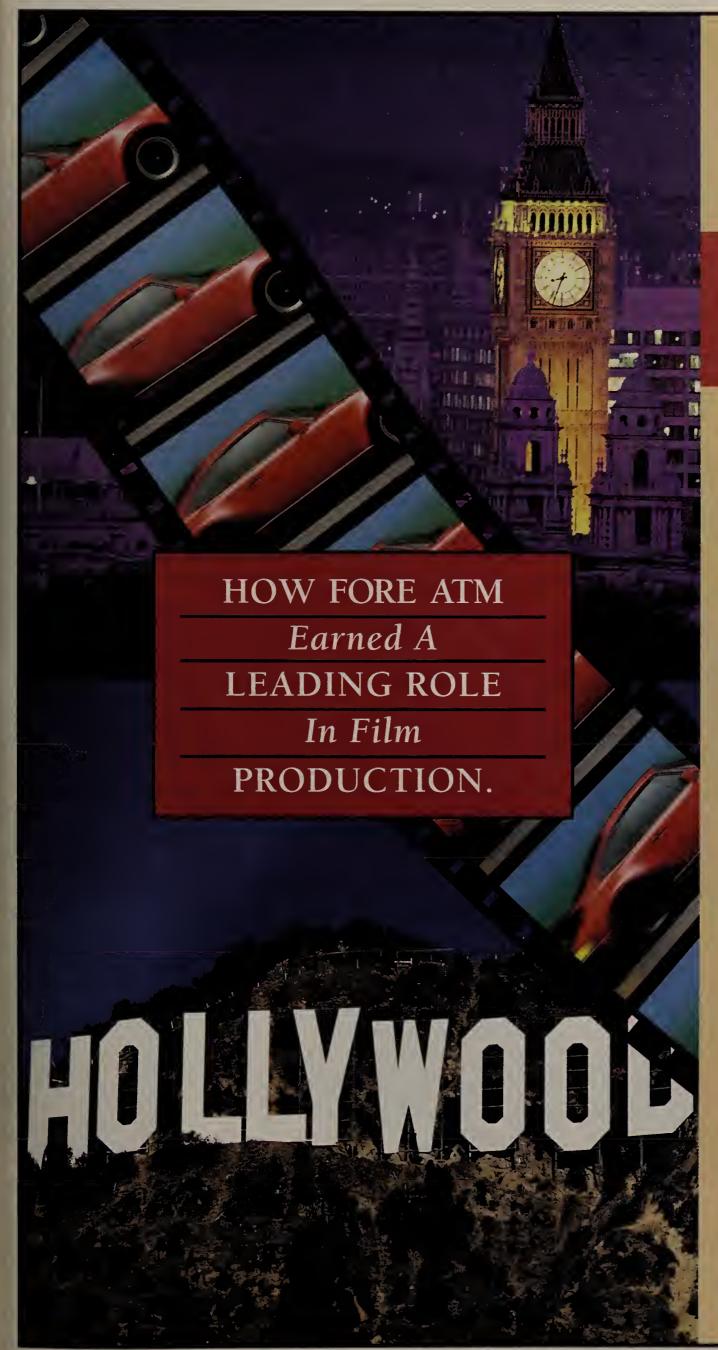
Performance improvement will vary depending on your situation. Independent tests of Shared LAN Cache conducted by Mier Communications, Inc. (funded by Mea-

surement Techniques) showed significant benefit for users with repetitive central file access — especially for those with slower PCs. The most dramatic improvement came on a 112K bit/sec link.

Measurement Techniques offers its LANTest benchmark software (see Web site) to help administrators determine how cache software will affect performance on their networks.

Do yourself a favor. Stop agonizing about fast-LAN upgrades and look into network cache products. You may be able to make a lot of people happy for a small investment.

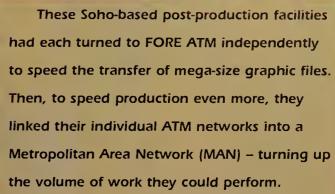
Buerger is an industry consultant and writer in Atlanta. He can be reached at dave@buerger.com.



"In the world of film production, if you can't turn around the work quickly, you won't get the work."

That's Mike Farrell, chairman of SohoNet, explaining why his network of computer animation and special effects facilities in Soho, London, England standardized on FORE ATM.

Mike Farrell Chairman SohoNet, Ltd.



"The FORE ATM MAN eliminates the delay of transferring film images to tape, transporting the tape and re-loading it onto another machine."

Now, two or more studios can work simultaneously on the same film sequence.

Digital film clips can be transferred as easily as email messages. Producers and directors can review work in progress by video conference and make revisions in real time.

And the sequel? Plans are being laid to extend the network via British Telecom in the UK, Europe and even to FORE ATM sites in Hollywood. As Mike Farrell puts it, "ATM is going to change the way our industry works."

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